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The Oil Man's Calendar

FEB.	
13–16	American Institute of Mining and Metallurgical Engineers, Annual Meeting, New York.
23–25	American Society of Mechanical Engineers, New Orleans, Louisiana.
23–25	Louisiana Engineering Society, New Orleans, Louisiana.
25	North Texas Oil and Gas Association, Wichita Falls, Texas.
MAR.	
16–17	Southwestern District, American Petroleum Institute, Division of Production, San Antonio.
20–22	Western Petroleum Refiners Association, San Antonio, Texas.
21–23	Society of Exploration Geophysicists, Huckins Hotel, Oklahoma City.
22–24	American Association of Petroleum Geologists, Skirvin Hotel, Oklahoma City, Oklahoma.
APR.	
3–7	American Chemical Society, Baltimore, Maryland.
11	Pacific Coast District A.P.I. Division of Production, Los Angeles.
13–14	National Petroleum Association, Cleveland, Ohio.
18–19	Mid-Continent District, American Petroleum Institute Division of Production, Oklahoma City, Okla.
24–29	Oil-World Exposition, Houston, Texas.
MAY	
3–5	Petroleum Electric Supply Association, Houston, Texas.
3–5	Petroleum Industry Electrical Association, Houston, Texas.
3–5	Natural Gasoline Association of America, Tulsa, Oklahoma.
15–18	American Petroleum Institute, Mid-Year Meeting, New Orleans, Louisiana.
JUNE	
15–16	Pennsylvania Grade Crude Oil Association, Hershey, Pa.

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This Week's Panorama

ALTHOUGH known producible unextracted oil reserves of the United States are at an all-time peak, and the industry has been suffering from an oversupply rather than a deficiency, the cry of a probable petroleum shortage grows louder in some quarters.

Politicians Fear Oil Shortage

In the single month that the present session of Congress has been underway, two bills have been introduced that base their necessity upon "an approaching scarcity of oil supplies."

One of these measures is so drastic it would nationalize the entire industry. No individual or private corporation would be permitted to engage in the oil business, and properties of present firms would be taken over by condemnation or purchase.

The other proposed act would give the federal government title to all off-shore oil fields, so that they might be conserved as a future naval supply.

Measures Indicate Trend

It is extremely unlikely that such a drastic measure as the nationalization bill will be passed at this time, as it is too much like the recent act of Mexico.

However, the introduction of such measures are indicative of the trend of thought among the average citizens and politicans of the nation, as well as those in other countries, and the industry would be wise to recognize the situation.

Unfortunately, the average United States citizen and congressman is not familiar with the economics of the industry. On the other hand it is easy for them to visualize a gigantic catastrophe if automobiles were to stall on the highways and industrial plants ceased to operate because of lack of petroleum products. Furthermore, recent frequent war scares have made them wonder if there will be sufficient oil for the modern highly mechanized army and navy in case of a prolonged armed combat. Likewise, it is very simple for them to realize that huge quantities of petroleum are being consumed annually.

Early Scarcity Unlikely

Prophets of such a disaster overlook a number of developments, from which certain potentialities emerge that present a clearer picture of the future prospects.

In the first place, it should be realized there will be no sudden cessation of discovery. When the time arrives that the United States is to soon experience a shortage of petroleum resources, new supplies will become increasingly harder to find at gradual rates as the number of ultimate fields near depletion. Ample forewarning will be provided by this factor. That the nation is not yet approaching such a period is indicated by the following developments:

1. The trend of discoveries of both volumes of oil and number of new fields are at the highest level in history.

2. Known crude reserves are at an all-time peak, and are equal to all the oil produced since 1870.

3. The United States still has vast possibilities for additional expansion of its oil supplies in unprospected territories, and through deep drilling.

Moreover, the ingenuity of the industry's engineers must be considered. Amazing progress has been made in scientific progress. More oil is being recovered from a given reservoir today, and a larger quantity of products are made from each barrel production. Present research work already has indicated forthcoming years are to see a continuation of these achievements.

Oversupply Becomes Serious

While some outside forces are concerned with the possibility of a petroleum shortage, those actually engaged in the business are struggling with an ever increasingly serious plight resulting from a mounting oversupply.

Last week, abandonment of the market-demand of Texas proration laws was suggested by Commissionmember Ernest O. Thompson, who for years has been outstanding as an advocate of production limitations.

The present discouraging outlook for the sale of oil from wells already drilled, plus the consistently rising volume of available supply as additional wells are completed, were the reasons for him reversing himself and making such a drastic suggestion.

Thompson asserted the commission was through finding markets for oil, as it had become an impossibility. He emphasized that operators who drill too many wells need not look to the commission for any more assistance in getting market outlets.

Attitude Significant At This Time

Colonel Thompson's attitude toward proration has greater significance at this time than it normally would deserve as merely a discussion of the economic situation.

Texas proration laws expire this year, and the first hearing on their extension is to be held February 15 at Austin. Since Thompson has shown an open mind on the question, additional parties are apt to express themselves as believing Texas might do better if

producers were allowed to produce as much oil as they like, as long as it did not cause actual physical waste.

Others Usurp Markets

When less oil is produced than being consumed, as has been the case for a year, a firm situation should result. But Thompson pointed out that instead, prices had declined.

"While we hold the umbrella over the world, other countries are dumping their production and producing oil and taking the foreign markets that we formerly enjoyed," Thompson asserted. It is almost the same thing that happened in cotton, and "we lost our cotton business."

Likewise, he pointed out the prosperity of California, Louisiana and Illinois, where there is far less regulation than in Texas.

Rising Gasoline Stocks Destroy Oil's Outlook

PRACTICALLY all hopes were abandoned last week that the oil industry might reach spring consuming months without an excessive quantity of gasoline in storage, as another material addition to these stocks carried them almost to the level considered economically desirable for March 31, 1939. With 8 more weeks before arrival of that date, it appears practically certain that the economically desired volume for gasoline stocks is to be exceeded.

Consequently, it is likely price schedules of 1939 are to be confronted with the same depressing problem that existed in 1938, when markets suffered throughout the year from early excessive crude runs to refining stills and the resulting accumulation of surplus stocks.

The only hope that the above situation may be avoided lies in a very sharp reduction of crude runs to stills during the next 8 weeks. It appears extremely unlikely that this will be achieved, for it would be necessary to cut the volume of oil charged to refinery stills to below an average of 3,000,000 barrels daily during the period, whereas they have been averaging approximately 3,200,000 barrels since October 1, 1938.

Despite a second weekly sizable reduction in refinery runs during the past week, as much gasoline went into stock tanks as in the preceding 7 days. An important influence was the continued snow and cold weather over a large part of the United States, which dropped consumptive demand materially.

Crude runs to stills during the week ended February 4, latest period for which statistics are available, averaged 3,140,000 barrels daily, a decline of 95,000 barrels from the preceding week, and a reduction of 170,000 barrels in the last two weeks. At this level, they were slightly below a year ago, when 3,149,000 barrels were sent through refining stills.

However, this reduction in crude runs failed to check the rapidly mounting volume of gasoline stocks. Almost 2,000,000 barrels were added to gasoline storage, which now amounts to 79,149,000 barrels. Although this is 9 percent under the 1938 week, it is nearly at the level economists have estimated gasoline stocks should be on March 31, 1939.

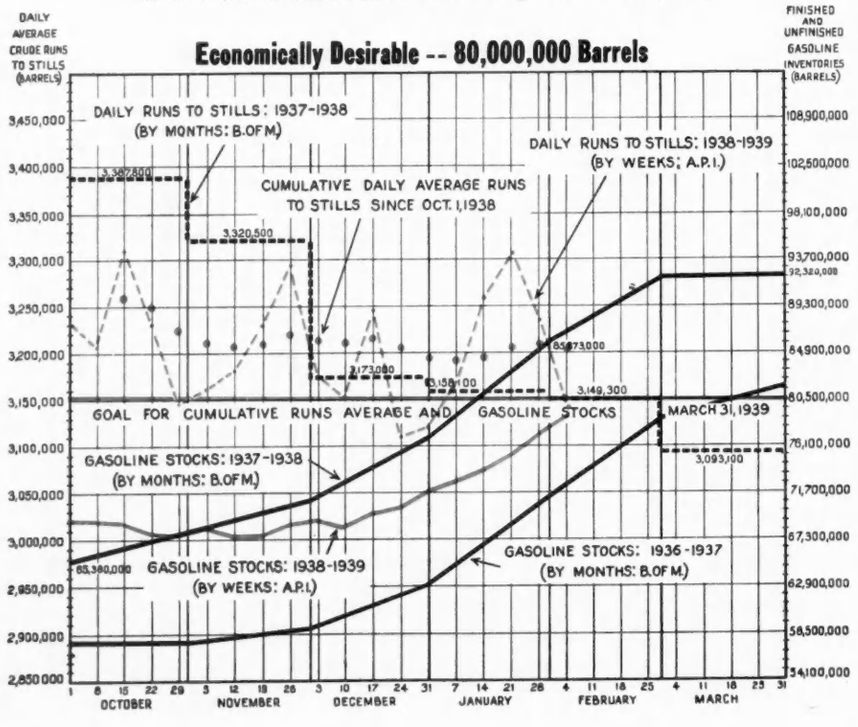
The maximum desired level of gasoline stocks on March 31 has been placed at 81,000,000 to 82,000,000 barrels. This position may be reached within another week. Therefore, with 8 more weeks before that date arrives, it would not be surprising to see 90,000,000 barrels in storage at that time. It is even possible that the 92,320,000-barrel level of a year ago may be attained, unless crude runs to stills are curtailed sharply during coming weeks.

In view of these conditions, prospects for improved prices for either crude or gasoline are vanishing rapidly. In fact, there are some fears that prices may not stand up in the face of continued pressure, which now appears likely to be exerted.

Since higher prices were in existence during the first 10 months of last year than now are posted, even a continuation of present market schedules would leave the industry lagging behind its 1938 earnings record.

The accompanying chart, originally prepared by Fred Van Covern, economist of the American Petroleum Institute, and published in these columns weekly with latest current statistics, clearly indicate the gasoline stock situation.

What Are Finished and Unfinished Gasoline Inventories Going to Be on March 31, 1939?



Gas Lift As a Production Method in East Texas

By W. N. REES, The Atlantic Refining Company

Presented to the East Texas Chapter, American Petroleum Institute, Kilgore, Texas, February 7, 1939.

THE method of lifting a fluid by air lift is by no means a recent invention. It was discovered by C. E. Locher in 1797, and a patent was obtained on the air lift in the United States more than 50 years ago. The air lift method of producing oil wells was employed at Baku, Russia, in 1899, and greatly increased the production over the crude methods previously used. Late in 1925, gas lifts were used in Tonkawa, which was the first use of this method of much importance in the Mid-Continent area. During the latter part of 1926, gas lift work was started in the Seminole field.

In gas lift work prior to the advent of kick-off and flow valves, the kick-off pressure was generally much higher than the working pressure used in a well, and depended on the submergence of the point of injection of the lifting medium. However, gas lift methods used during that period are quite different from modern gas lift methods and equipment. With present gas lift equipment, the lifting medium is injected into the tubing string at intervals as it is needed to produce the fluid. Consequently, the kick-off pressure and the working pressure in any particular well is generally the same.

In 1931, kick-off valves were first used in the East Texas field; three years later (March, 1933) flow valves were initially used in a well in the vicinity of New London. Since that time, the number of installations has increased, until, at the present time there are 1336 wells equipped for gas lift. Of these wells so equipped, 675 are produced by gas lift, and 661 have distribution systems installed but are now either flowing or produced by other methors. Due to water encroachment, 300 wells are flowed by gas lift, while 375 wells are using gas lift because their bottom-hole pressures are so low that artificial lift is needed.

There are varied sources of the lifting media used in producing gas lift wells in the East Texas field. Two hundred ninety-seven wells are furnished high-pressure gas direct from gasoline plants; 219 wells are produced by residue gas which has been compressed by booster plants to the required pressure; 93 wells are flowed by high-pressure gas from recycle plants; high-pressure air is used to lift 17 wells; and extraneous high-pressure gas from gas wells is used as a lifting medium in 49 wells.

Because of the high productivity factor of the Woodbine sand, relatively high bottom-hole pressure at the point wells cease natural flow, high gravity oil, medium depth of wells, gas in solution, and comparatively slow rate of bottom hole pressure decline in the reservoir, the East Texas field is particularly adaptable to gas lift production methods. On the other hand, the lack of adequate high pressure natural gas near the field has handicapped the more extensive use of gas lift.

Sources of Input Gas

There are several sources of high pressure input gas for producing wells by gas lift in the East Texas field. Natural gasoline plants are at present furnishing the lifting medium at the required pressure for more wells than any other source. Wells on gas lift furnish wet gas to the gasoline plants which process the gas and return it as high pressure residue (250 to 300 pounds per square inch). A constant pressure on the high pressure residue lines is usually accomplished by:

1. Governing the input volume to the compressor by regulating the intake pressure.
2. Allowing excessive high pressure residue gas to flow into the low pressure residue system.

Except when the volume of wet gas to the plant is insufficient to meet the requirements of the system, or on rare occasions when excessive amount of both high and low pressure residue are required, the pressure on the high pressure residue gas lines remains fairly constant. On occasions, when drilling rigs are furnished residue, or when wells are shut in due to proration schedules, it is sometimes impossible for the plants to furnish sufficient residue gas.

Booster plants compressing residue gas furnish the next largest group of wells with a lifting medium. Booster plants are single stage compressor plants and operate in the same manner as any other type of compression equipment. They merely increase the pressure of the gas from an intake pressure of as low as 50 pounds per square inch to the ordinary working pressures of 250 to 400

pounds per square inch. The principal advantage of the booster plant over other types of compressor plants is that about half of the horsepower is required for single stage compression as is required for two stage compression. Consequently, the initial cost of booster plants to do a specified lifting job is much less than that of two stage compression plants.

The principal disadvantage in the use of booster plant equipment is that it cannot be operated efficiently unless the intake pressure is a minimum of 50 pounds per square inch. Due to varying demands upon gasoline plants, because of the limited capacities of most residue gas lines as originally installed, and since recent proration schedules went into effect, satisfactory pressures cannot always be maintained. Therefore, forced intervals of shut down are inevitable.

It is quite probable, that in the future, the trend will be away from this method of operation, particularly where wells producing quantities of water are being gas lifted. In those parts of the East Texas field where very small quantities of water are anticipated, and where other conditions are favorable, it is entirely possible that booster plants may be used for a number of years without being confronted with an insufficient supply of residue gas.

Gaining rapidly in favor with a large number of operators, and a type of compression equipment, which in the future will probably be the most widely used, is the re-recycle plant. In a plant of this type, a two-stage compressor, cooling tower, scrubber, regulating devices, and intercooler are the principal pieces of equipment required. The principal purpose of the plant is to conserve gas as a lifting medium by recycling it. The wet gas passes from the lease oil and gas separator through the necessary scrubber and regulating devices to the intake of the low-pressure cylinder of the compressor where it is compressed to approximately 75 pounds per square inch. Upon leaving the low-pressure cylinder, the gas passes through an intercooler which removes the gasoline condensate that is entrained with the gas. After passing through the intercooler, the gas is boosted in the high pressure cylinder of the compressor to a predetermined pressure required for its most efficient use as a lifting medium.

The gasoline condensate, a by-product in the operation of the plant, increases the lease revenue and takes care of a portion of the lease operating expenses. The usual source of available gas to serve this type of plant is the same as for the booster-plant, that is, residue gas from a gasoline plant. However, with the two-stage compression, it is not necessary that the residue line be under any definite pressure. During the operation of the plant, there will be periods when the available wet gas will not be sufficient to supply the needs for input gas. It is then necessary to use gas from the residue system of the gasoline plant. Also, at intervals, there will be an amount of wet gas in excess of the input gas requirements. This excess gas passes to the gasoline plant.

The Principal advantages of the recycle plant are:

1. It may be operated almost independently of a gasoline plant.

2. Unless the volumes of water produced by the wells are large, it will not exceed its maximum allowable of residue gas from the gasoline plant.

3. Because of its two-stage compression, it may be used independently of the gasoline plant as an ordinary compressor unit. In this latter case it would not be operated as a recycling plant.

4. Increased lease revenue derived from gasoline condensate.

Air Compressors

Because residue gas is available in practically all parts of the East Texas field, air lift has not been used in most cases where flow valves were installed. Consequently, a limited number of wells are flowed by air lift. In the future when conditions are such that adequate residue gas is not available, or it is impossible to have any residue gas supply, recycle plants will be used in most instances instead of air compression plants.

In using compressed air as a lifting medium, it is necessary to use two-stage compression equipment. The cost of the initial investment approaches that of the recycle plant, yet the advantages of the recycling method are not available in an air compressor plant. The mixture of gas and air from the wells that are produced by air lift may not be passed to a gasoline plant, or be used again in compressor equipment without risking an explosion caused by the mixture when it is compressed.

Extraneous High-Pressure Gas

Until recently, the only available extraneous gas for the East Texas field at an adequate pressure for gas lift operations has been that furnished by a commercial gas company. The use of this gas has been severely restricted because its cost made gas lift operations less economical than other means of artificial lift. The one purpose for which this gas has been used in connection with gas lift, has been merely as make-up gas when a deficiency of residue gas existed in the gasoline plant distribution system.

During 1938, two high-pressure gas wells were drilled east of the East Texas field near Longview. These wells have an aggregate potential of 53,000,000 cubic feet per day. It is anticipated that high-pressure lines from the wells to the field, to be used for gas lift purposes, will be laid in the near future. Whether the gas will be available for other than private use has not been divulged.

During the latter part of 1938 the gas from a high-pressure gas well located about 8 miles west of the East Texas field in the Chapel Hill area was piped into the East Texas field near Overton. From this point a line was laid to the southwest part of the field. At present, a north extension is being laid to the W. P. Chism survey, and construction to date is to the Gregg County line. The gas in this system is to be marketed, and its principal use will be to produce gas lift wells. A line pressure of 500 pounds maximum is available if desired. The gas well has a potential of 32,000,000 cubic feet a day, which according to proration schedules, is allowed to produce one-fourth of its daily potential.

The method of gas lifting wells by producing them with extraneous high-pressure gas approaches natural flow methods closer than any other type of artificial production. The well is produced in most cases by merely opening the tubing valve and allowing the well to flow until its allowable is produced. When high pressure gas is furnished by a gas well, shut downs due to lack of gas because of mechanical trouble are reduced to a minimum. Probably any shut downs which might occur would be due to line failure. It is possible to maintain a constant pressure on

the gas lines so long as the requirements do not exceed the potential of the well, because of the ability of a gas well to produce at different rates of flow as gas is needed.

The initial cost of equipping a lease for gas lift is greatly reduced when extraneous high pressure gas is furnished, because the cost of compression equipment is eliminated. At the present time, the principal disadvantages of using extraneous high pressure gas are:

1. Lack of an adequate distribution system covering the East Texas field.

2. Lack of an adequate supply of gas should a comparatively large number of wells be equipped for gas lift.

3. Cost of gas to the operators.

Application of Gas Lift to Various Types of East Texas Wells

Wells in the East Texas field may be placed in the following classifications for the purpose of explaining the reasons for their requiring distinct types of gas-lift installations:

First, that type of well having a sufficiently high bottom hole pressure for natural flow, but requires artificial lift due to water. In a well of this kind, the static fluid level is relatively high; the working fluid level is somewhat lower depending on the productivity factor of the well and the rate of production. The number of valves installed in the well depends upon the productivity factor, rate of production expected, percentage of water produced with the oil, casing pressure to be used, and the bottom hole pressure of the well. Probably the most important to be considered is the productivity factor of the well, because it determines the rate of flow into the well bore and the working fluid level under set operating conditions. A well of this type is usually equipped with 8 to 10 flow valves, but no standing valve or packer is used. Some operators have the erroneous idea that the working fluid level of a well producing a large percentage of water will be relatively high, but it has been found by experience that in a majority of cases the working fluid levels are below 2200 feet from the surface. In some cases, particularly where a small amount of sand has been drilled, or the well has been plugged back, the working fluid level will drop below 3000 feet.

Second, the well in the field where salt water encroachment is not anticipated, and where the bottom hole pressure is sufficiently high to sustain a fluid level in the casing and tubing against the line pressure to a point where the daily allowable may be produced from the well without exhausting all of the fluid from the casing. It is very simple to produce this type of well, and usually from four to seven valves are used, depending upon the bottom hole pressure and productivity factor of the well.

Third, the well with a relatively low bottom hole pressure. In this type of well, the fluid level will not rise in the casing and tubing, against the line pressure, to a point where there is adequate reservoir capacity for producing the daily allowable from the well. It is then necessary to either run a closed system using one or more valves, or to bleed the pressure off the casing and tubing at the end of each flow period.

A closed system may be defined as one in which one or more valves are used in a tubing string; a standing valve and a packer are used, but there is no perforation in the tubing above the packer. The tubing is packed off from the casing, and the casing is used merely as a reservoir for the input gas. When the well is produced, the unloading valves, if any, flow the fluid from above the bottom valve. The bottom valve then flows the fluid intermittently from the well as the oil feeds into the tubing.

If an open type installation is used, that is, if a perforation is used in the tubing above the packer and standing valve, or if no packer is used, thereby allowing the fluid to accumulate in the casing and tubing while the well is shut in, it is necessary to bleed the pressure off the casing to allow the fluid to rise to its normal static fluid level. If this method is used, there will be a considerable waste of gas each time the casing is bled off. After the bottom hole pressure has decreased to approximately 300 pounds per square inch, it would be practically impossible to use this method to produce the daily allowable from the well.

Economics of Gas Lift

The general conception of most operators derived from experience in Corsicana, Seminole, El Dorado and similar fields where gas lift operations were used, is that gas lift was quite an expensive method of operating an oil well. In each of these fields, gas lift was used to increase an existing natural flow beyond the point of the reservoir's ability to properly supply the required volume of fluid. The result in nearly every instance was to invite the rapid encroachment of water. This method of operation proved very expensive in the later life of the wells.

The modern methods and equipment for gas lifting are totally different from those past practices and equipment. It is now the common practice to produce a well in the East Texas field at a rate and in a manner to retard water encroachment rather than attempt to flow an excessive volume of water from the well to permit the allowable oil to be produced. However, as has been proved by past experiences, gas lift is able to produce very large quantities of fluid when necessary. In the older fields, before the use of flow valves became common, it was impossible to produce wells having low bottom-hole pressures and low productivity factors by the use of gas lift. Flow valve equipment has been developed that now makes it economically possible to produce this type of well by gas lift.

When gas lift operations are contemplated, several questions arise:

1. Adaptation of gas lift methods to a particular well or lease.

2. Initial investment.

3. Operating costs.

In those parts of the East Texas field where water has encroached or is anticipated, many operators have been convinced by past experience that it is possible to produce wells to economic depletion without handling a large percentage of salt water. This is accomplished by producing the well at a rate so that the bottom hole pressure in the well, during the flow period, remains as nearly as possible at the static bottom-hole pressure. However, in the event it is not possible to deplete the well without handling large volumes of water, modern gas lift methods, by reducing gas fluid ratios to a minimum, have proved to be an economical method of production. The use of gas lift on wells with large quantities of water is economical from an operating standpoint because the major portion of the equipment, where compressor plants are used, is on the surface where it may be readily maintained. The following table shows the results of tests on groups of

Group	Percent Water	Oil and Water, Bbls./Hr.	Input Gas/ Fluid Ratio	Input Gas/ Oil Ratio	Remarks
A	3	7.89	382	397	
B	15 to 30	32.53	117	212	Intermitting from 2950 ft. Working fluid levels were below 2200 feet in practically every case.
C	31 to 45	25.12	272	440	
D	46 to 60	23.47	274	607	
E	61 to 75	20.66	397	1323	
F	76 to 90	27.68	404	2654	

wells producing from 3 to 90 percent water.

Probably the gas fluid ratios will average a maximum of 600 cubic feet per barrel on wells producing approximately 90 percent water, and where the working fluid levels drop to 2500 feet. When flow valves are installed in a well producing water, after a correct setting has been made, data show that on an average, they will not require pulling more often than once every 2 or 2½ years to be repaired, or to be reset.

In those parts of the field where very little or no salt water is anticipated, wells generally cease natural flow when the bottom-hole pressures drop to a minimum of 800 pounds per square inch. If wells are equipped with flow valves at this time, it has been found that they may be produced economically for several years before it is necessary to change the method of gas lifting.

From January 1, 1935, to January 1, 1939, the average bottom-hole pressure in the East Texas field dropped 135 pounds per square inch. This constituted an average rate of decline of 33.75 pounds per year. On the west side of the field, the average rate of decline was less, and on the east side of the field the rate of decline was greater. Assuming the average rate of decline for the east side of the field to be 4 pounds per month, or 48 pounds per year, no change in the gas lift method should be necessary for a period of at least 6 years, or until the bottom-hole pressure dropped below 500 pounds per square inch. During this time, the average input gas fluid ratios should not exceed a maximum of 450 cubic feet per barrel.

When a well has just ceased natural flow and is produced by gas lift, the input ratio usually varies from 75 to 150 cubic feet per barrel. As the static bottom-hole pressure decreases, the input ratio increases, until, usually an input ratio of 500 cubic feet per barrel becomes the average, for a well with a static bottom-hole pressure of 500 pounds per square inch. It has been found that a well in this range of static bottom-hole pressures (500 to 800 pounds), varies in its gas requirements, depending upon its static bottom-hole pressure, productivity factor, and casing size. These are the contributing factors affecting the working fluid level in the well.

When the static bottom-hole pressure in a well declines below 500 pounds per square inch, a change in the method of gas lifting the well is required unless the productivity factor is high. If the productivity factor is high, the rate of "feed in" to the well is sufficient to provide the necessary fluid to make up the deficiency of fluid in the casing for the wells allowable. However, the productivity factors in most wells near and on the east edge of the field are very low; therefore, it is impossible to use an open system type of flow valve installation unless the pressure on the casing is "bled off." If the pressure is "bled off" the casing after each flow period to allow the fluid to rise in the casing against atmospheric pressure, a quantity of gas is wasted which usually exceeds that required to flow the allowable from the well.

By using a closed system type of installation in a well, it is possible to produce the well with a gas fluid ratio not in excess of 750 cubic feet per barrel until the static bottom-hole pressure becomes very low. It is the opinion of a number of engineers and operators that with gas lift equipment now available, it will be possible to produce a large percentage of the wells in the East Texas field to economic depletion; and records show that with gas lift, several wells on the east side have been produced to this point. However, other artificial production methods have proved more successful on some wells in this area than gas lift. It is anticipated that as gas lift equipment is improved and as gas lift production methods are more thoroughly understood, wells not now adaptable to gas lift production methods will come within the scope of future gas lift operations.

Data compiled over a period of 5 years show that when the correct flow valve installation has been made in a well on the east side, it is not necessary to pull the valves for repairs or to reset them more often than an average of once every 2 or 2½ years. There are numerous instances where flow valves have been in continuous operation in wells for over three years and are still giving efficient results. Considerable experimental work has been done with flow valves during the past three years, and much has been learned of the technique of flow valve operation. Because of this, it should be possible in practically all cases to install a set of flow valves and expect efficient operation without the necessity for pulling and resetting the valves several times. Most of the wells giving trouble are those with extremely low fluid levels and low permeability, and those producing water with a low productivity factor. During the past year considerable work has been done and progress has been made toward eliminating the causes of the trouble.

The initial investment cost of equipping wells and leases in the field varies considerably, and depends on the type of surface and subsurface equipment required. The cost of surface equipment depends on the following factors:

1. Whether high-pressure gas is furnished to the lease from an external source in the amount and at an adequate pressure for efficient gas lift operations.
2. Type of compressor equipment required. If compressor equipment is to be used, several points to be considered are:
   a. Quantity and pressure of gas available for compression and dependability of source.
   b. Type of compression equipment to be installed.
   c. Size of compressor plant required for both present and future gas lift operations.
   d. Economic life of wells or lease.

The cost of subsurface equipment depends upon the number of flow valves and other equipment used: such as packers, standing valves, etc. In order to make reasonably close estimates of initial installation costs to equip various size leases with various types of equipment for gas lift operations, it has been necessary to divide the wells in the East Texas field into two distinct groups:

(1) Those wells where water has encroached or is anticipated.
(2) Those wells where little or no water encroachment is expected.

This division was necessary, pri-

marily, because of the requirement for larger compressor capacity for wells where water encroachment is expected. Estimates of initial installation costs are as follows:

A. **Those wells where water encroachment is expected.**

1. High pressure gas available at lease property line:
   5 well lease:
   Subsurface equipment—well fittings and labor to install, per well.....$725.00
   Prorata share of distribution system, per well.... 160.00

   Total cost to completely equip well...$885.00

The installation cost per well remains approximately constant whether there are a small number or large number of wells on a lease.

2. Compressor Plants: (Compressor capacities based on input gas fluid ratio of 600 cu. ft. per bbl., 60% water and 12 hr. operating period or 100% overload factor.)

The following estimates include compressor equipment construction work, distribution system, well fittings, subsurface equipment and labor for installing:

(1) **Booster Plant** (Single-stage. Gas from residue line.)
(Intake pressure: 50 to 75 lbs. per sq. in. Discharge pressure: 400 lbs. per sq. in.)
a. 5 well lease.....$1,500 per well (Compressor capacity 320,000 cu. ft. per 24 hrs.)
b. 12 well lease or larger .....$1,350 per well (Compressor capacity 650,000 cu. ft. per 24 hrs.)

(2) **Recycle Plant** (2-stage. Gas from separator or residue lease.)
(Intake pressure: 0 lbs. per sq. in. Discharge pressure: 400 lbs. per sq. in.)
a. 5 well lease.....$2,400 per well (Compressor capacity 300,000 cu. ft. per 24 hrs.)
b. 12 well lease or larger .....$2,200 per well (Compressor capacity 660,000 cu. ft. per 24 hrs.)

B. **Those wells where water encroachment is not anticipated.**

1. High pressure gas available at lease property line:
   5 well lease:
   Surbsurface equipment—well fittings and labor to install, per well.....$795.00
   Prorata share of distribution system, per well... 160.00

   Total cost to completely equip well...$955.00

The installation cost per well remains approximately constant whether there are a small number or large number of wells on a lease.

2. Compressor Plants: (Compressor capacities based on input gas-fluid ratio of 800 cu. ft. per bbls., and on 12 hr. operating period or 100% overload factor.)

The following estimates include compressor equipment, construction work, distribution system, well fittings, subsurface equipment and labor for installing:

(1) **Booster Plant** (Single-stage. Gas from residue lease.)
(Intake pressure: 50 to 75 lbs. per sq. in. Discharge pressure: 300 lbs. per sq. in.)
a. 5 well lease.....$1,480 per well (Compressor capacity 170,000 cu. ft per 24 hrs.)
b. 10 well lease or larger .....$1,300 per well (Compressor capacity 320,000 cu. ft. per 24 hrs.)

(2) **Recycle Plant** (2-stage. Gas from separator or residue line.)
(Intake pressure: 0 lbs. per sq. in. Discharge pressure: 300 lbs. per sq. in.)
a. 5 to 10 well lease.$1,830 per well (Compressor capacity 160,000 cu. ft. per 24 hrs.)
b. 20 well lease or larger .....$1,500 per well (Compressor capacity 640,000 cu. ft. per 24 hrs.)

Operating Costs

1. Compressor Equipment:
   (1) Maintenance and repairs per B.H.P. per year.....$0.90
   (2) Lube oil @ $1.17 per B.H.P. per year..... 1.17
   Total operating cost per B.H.P. of compressor equipment per year...$2.07
2. Distribution System:
   (1) Maintenance on lines and laterals @ $10.00 per well per year.....$10.00
3. Pulling jobs (1 per well every 2 years) @ $65.00.... 32.50
4. Repairs to subsurface equipment @ $45.00 per well per year 45.00

   Total operating cost of subsurface equipment and distribution system per well per year.....$87.50

A. **Those wells where it is required to handle a maximum of 90% water.**

1. Booster Plant (Single-stage.) Required 12.5 B.H.P. per well.
   Analysis of Operating Cost:
   Operating cost per well per year of compressor equipment (2.07 x 12.5 B.H.P.)...$25.87
   Operating cost of subsurface equipment and distribution system per well per year 87.50

   Total cost of operating one well per year using Booster Plant $113.37
2. Recycle Plant (Two-stage.) Required 22.5 B.H.P.
   Analysis of Cost:
   Operating cost per well per year of compressor equipment ($2.07 x 22.5 B.H.P.)..$46.57
   Operating cost of subsurface equipment and distribution system per well per year 87.50
   Total cost of operating one well per year using Recycle Plant $134.07
3. Extraneous High Pressure Gas.
   Analysis of Operating Cost:
   Total operating costs of subsurface equipment and distribution system per well per year $87.50

To the above must be added the cost of the high pressure gas which may be determined by referring to Tables No. 1 and No. 2.

B. **Those wells where little or no water is handled.**

1. Booster Plant (Single-stage.) Required 4 B.H.P.
   Analysis of Operating Cost:
   Operating cost per well per year of compressor equipment ($2.07 x 4 B.H.P.)....$ 8.28
   Operating cost of subsurface equipment and distribution system per well per year 87.50

   Total cost of operating one well per year using Booster Plant .....$ 95.78
2. Recycle Plant (2-stage.) Required 8 B.H.P.
   Analysis of Operating Cost:
   Operating cost per well per year of compressor equipment ($2.07 x 8 B.H.P.)...$ 16.56
   Operating cost of subsurface equipment and distribution system per well per year 87.50
   Total cost of operating one well per year using Recycle Plant $104.06
3. Extraneous High Pressure Gas.
   Analysis of Operating Cost:
   Total operating cost of subsurface equipment and distribution system per well per year .....$ 87.50

To the above must be added the cost of the high-pressure gas which may be determined by referring to Tables No. 1 and No. 2. The above operating costs are based on a daily allowable of 20 barrels of oil per well. These costs do not include amortization, depreciation, taxes, insurance, or labor.

TABLE 1

Cost of Gas to Produce 1 Barrel of Fluid

Input Ratio Cubic Feet per Barrel of Fluid	Input Gas—Cost per M			
	6¢	8¢	10¢	12¢
400	2.4¢	3.2¢	4.0¢	4.8¢
600	3.6	4.8	6.0	7.2
800	4.8	6.4	8.0	9.6
1,000	6.0	8.0	10.0	12.0

Paraffin and Emulsion Problems

In wells having low bottom-hole pressures, and consequently slow rates of flow, paraffin accumulation

TABLE 2

Cost of Gas to Produce 1 Barrel of Oil.

(Assuming an input Gas-Fluid Ratio of 600 cu. ft. per bbl.)

Percent Water	Barrels of Fluid	INPUT GAS—COST PER M			
		6¢	8¢	10¢	12¢
50	2.0	7.2¢	9.6¢	12.0¢	14.4¢
60	2.5	9.0	12.0	15.0	18.0
70	3.3	11.88	15.84	19.8	23.76
80	5.0	18.0	24.0	30.0	36.0
90	10.0	36.0	48.0	60.0	72.0
95	20.0	72.0	96.0	$120.00	$1.44
99	100.0	$3.60	$4.80	.....	.....

presents a problem which must be handled periodically to allow the well to satisfactorily produce its daily allowable. This is particularly the case when the rate of flow from a well declines to a point where it becomes necessary to produce the well 24 hours each day to produce its allowable. Paraffin accumulates in wells of this type and must be removed periodically whether the well is flowing naturally, produced by gas lift, or produced by any other artificial method. It has been found that the accumulation of paraffin is not accelerated by gas lift, unless the installation is inefficient, or unless there is a continual leakage of gas from the casing into the tubing. Several operators in the field control paraffin accumulation by periodically scraping the walls of the tubing with a paraffin knife. When this is done, paraffin presents a very minor problem and the cost of its removal is extremely low.

Other gas lift wells do not present any greater paraffin problem than do natural flowing wells. In wells where considerable water is being produced, paraffin accumulation has not occurred, nor is it anticipated. Data show that a number of gas lift wells, some of which are on the last edge, have each produced in excess of 15,000 barrels in over 2½ years without having paraffin removed from them. As a rule, wells producing various amounts of water will show a higher percentage of emulsion when produced by artificial methods than during the natural flow. This is caused by turbulence and intimate mixture of the oil and water.

If gas lift is efficiently applied to a well, the emulsion has proved no harder to treat than when a well is produced by other artificial methods. The application of heat will, in most instances, break down the emulsion into pipe line oil and water; however, the addition of small quantities of chemicals with the heat successfully breaks any emulsion formed. Wells producing small amounts of water (less than 5%) form tighter emulsions than those producing somewhat larger quantities of water. When gas lift is inefficiently applied to a well, the excessive turbulence causes an increase in the amount of emulsions. In a stripper well, emulsion is increased due to slippage of gas through the oil and water being produced.

The Effect of Gas Lift on Gasoline Plant Operation

There has been considerable discussion among many of the East Texas gasoline plant supervisors as to what the future outlook will be for those plants that will be connected to and buying gas from gas lift leases. Several of the plant superintendents have already had experience in gas lift operations in the older fields, and are prone to look on the situation here, and the future use of gas lift as it was before modern gas lift methods were practiced.

There are a few plants in the East Texas field that are already processing gas from gas lift leases, and are looking upon the gas lift situation much more favorably than before, as they have found that not only the technique of gas lifting has changed, but there is now a positive control over high gas/oil ratios that did not exist a few years back. It has been shown through periodical testing of gas lift wells, and by using such information to advantage, that it is possible to reduce the input gas/oil ratios on the higher ratio wells as much as one-third to one-half of the original volume required. By periodical testing, the few high ratio wells are quickly picked out, and valves reset to meet the changed conditions in the well. The results of such tests show that, over a period of one year, the overall input ratios have been decreased as much as 30 percent, even though the wells have gradually become weaker, and necessarily required more energy for producing from lower fluid levels. The results have been advantageous to the operator by insuring efficient operation and production control.

Since an additional volume of gas is produced with the oil from a well when gas lift is used, the amount depending largely upon the input gas/oil ratio, it is readily understood that the gasoline plants will be required to process more gas per barrel of oil produced than it would if the well was flowing naturally, or perhaps produced by another method. This may cause the plant to either operate nearer its capacity, or in some cases may call for additional equipment.

Should a gasoline plant furnish residue gas at the required pressure for gas lifting wells, usually changes in the plant and distribution systems must be made. The gasoline plant is the logical distribution point, in most cases, for furnishing high pressure gas to produce gas lift wells, because it has a large capacity for storing gas and has positive control over the volume of residue gas returned. This places it in a position to take care of the fluctuations in the amount of gas required by the operator, and of the volume of gas returned to the plant. The cooperation between the operator and the plant by frequent checks on the volume of residue gas used and of wet gas returned, makes possible the efficient use of gas lift for producing wells.

The percentage of casinghead gas returnable as residue after extraction and plant use, plotted against gallons per thousand cubic feet (as shown by Natural Gasoline Association Residue Gas Curve, plotted from actual plant data) is shown in Chart 1. On the same chart is plotted a curve showing the relationship of the maximum input gas per barrel of oil produced to which the operator is entitled to receive as residue against gasoline recovery in gallons per thousand cubic feet of wet gas. In connection with this curve, a formation gas/oil ratio of 350 cubic feet per barrel of

oil produced was used. The maximum input gas/oil ratio was calculated by using the following equation:

$$I = \frac{\% \quad F}{1 - \%}$$

The equation was derived as follows:

$$F + I = T \text{ and } R = \% \ T$$
$$I = R$$
Therefore, $(F + I)\ \% = I$
Then, $I = \frac{\% \quad F}{1 - \%}$ where,

F = Formation gas/oil ratio per barrel of oil produced (350 cu. ft. per bbl. average)

I = Maximum input gas/oil ratio that may be used

R = Maximum returnable gas per barrel of oil produced

% = Percent of wet gas returnable as residue (depends upon the G.P.M. of the wet gas

T = Total wet gas to gasoline plant per barrel of oil produced.

By using chart the maximum residue gas allowable may be determined, knowing of course, the gasoline content of the wet gas for the period covered by the last test.

Booster plants depend upon the gasoline plants for their residue gas. Therefore, their relationship with the plants is similar to that of the operators being furnished residue gas at the required pressures for gas lifting their wells. Practically the only difference lies in the pressure on the residue lines.

Summary

Rapid strides have been made during the past few years in gas lift equipment and methods, and with their continual improvement, gas lift as a production method is destined to play an important part in the future production of the East Texas field.

The surface and subsurface equipment must be correctly installed to give the desired efficiency of operation. Operating costs may be kept at a minimum by periodically running flow tests on the wells, and by repairing and resetting the flow valves in those wells where high gas-fluid ratios exist.

The lifting medium for future gas lift operations will probably be supplied by gasoline plants and extraneous high pressure gas. The gas available from gasoline plants will become insufficient for gas lift operations where large volumes of water will be handled.

The quantities of extraneous gas to be used will be dependent upon the cost of gas to the operator, and upon future developments of high pressure gas reserves.

Acknowledgements

Special thanks are extended to The Atlantic Refining Company for permission to prepare and present this paper, and to engineers and production men of various companies for valuable assistance in furnishing data and suggestions in the preparation of the paper. Thanks are also due the representatives of the manufacturers of compressors and other gas lift equipment for their full cooperation in supplying information and valuable suggestions.

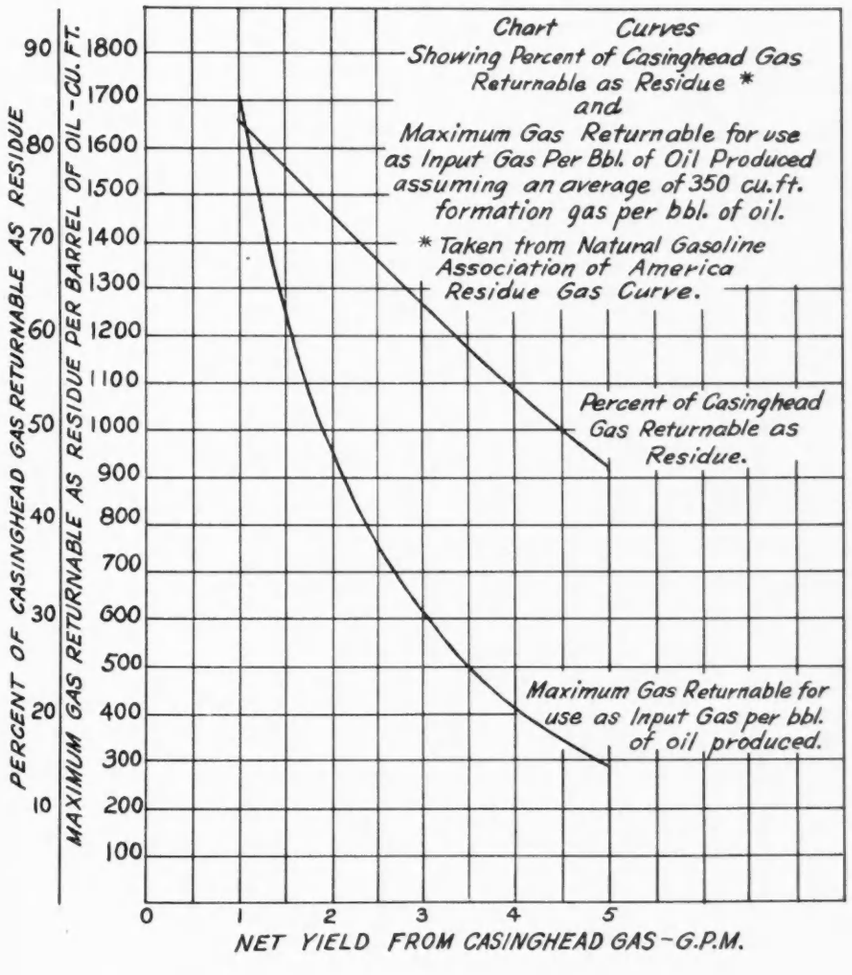


Chart Curves
Showing Percent of Casinghead Gas Returnable as Residue *
and
Maximum Gas Returnable for use as Input Gas Per Bbl. of Oil Produced assuming an average of 350 cu.ft. formation gas per bbl. of oil.
* Taken from Natural Gasoline Association of America Residue Gas Curve.
Percent of Casinghead Gas Returnable as Residue.
Maximum Gas Returnable for use as Input Gas per bbl. of oil produced.
PERCENT OF CASINGHEAD GAS RETURNABLE AS RESIDUE
MAXIMUM GAS RETURNABLE AS RESIDUE PER BARREL OF OIL - CU. FT.
NET YIELD FROM CASINGHEAD GAS - G.P.M.
90 80 70 60 50 40 30 20 10
1800 1700 1600 1500 1400 1300 1200 1100 1000 900 800 700 600 500 400 300 200 100
0 1 2 3 4 5

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For a more complete discussion of some of the points mentioned in this paper reference is made to the following literature:

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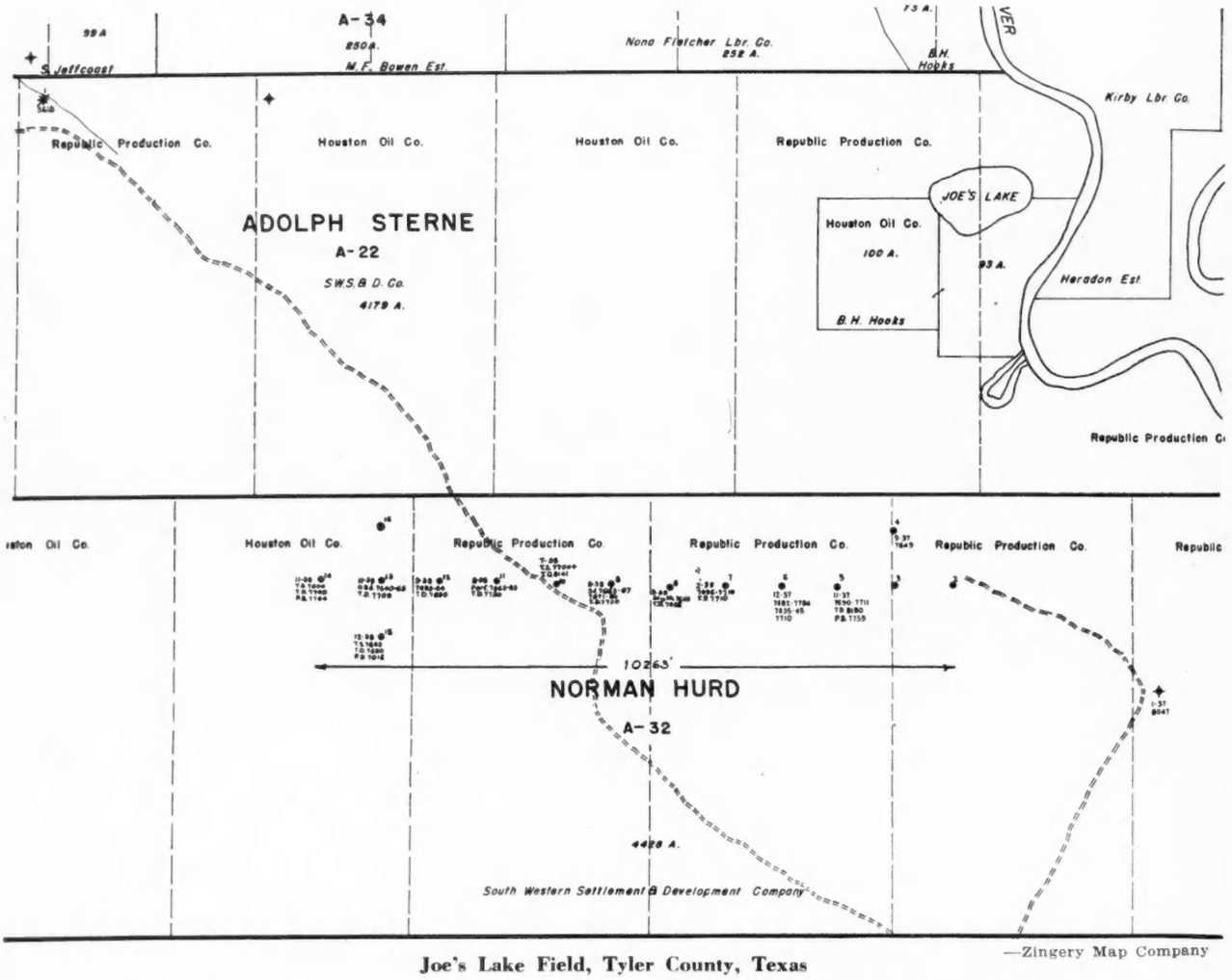
New Discoveries Add Knowledge of Sparta-Wilcox

PRACTICALLY all knowledge of the down dip facies of the Lower Eocene formations is less than three years old, dating back to the Hurd 1 well of Houston Oil Company and Republic Production Company. This well, on the edge of what later proved to be the Joes Lake oil field in Tyler County, was the first to explore the sand possibilities of the deeper Sparta-Wilcox zones. Due to the fact that there are no official releases of information by Houston Oil Company and Republic Production Company, the information obtained from the Hurd 1 well has been available to the oil industry less than two years. In fact the electrical log of the Hurd 1 well has been generally available only for the past two months.

During these past two years knowledge of these formations has continued to grow, but only in a slow and scattered way. There have been surprisingly few wells drilled to the Sparta or Wilcox formations, and probably not over a dozen tests which have really contributed to supplementing our knowledge of subsurface conditions. Most of the wells that have been drilled have been located on the down dip side of the Trend, as it has proven more attractive because of its proximity to the well established Oligocene Trend.

On this down dip side of the



Joe's Lake Field, Tyler County, Texas

—Zingery Map Company

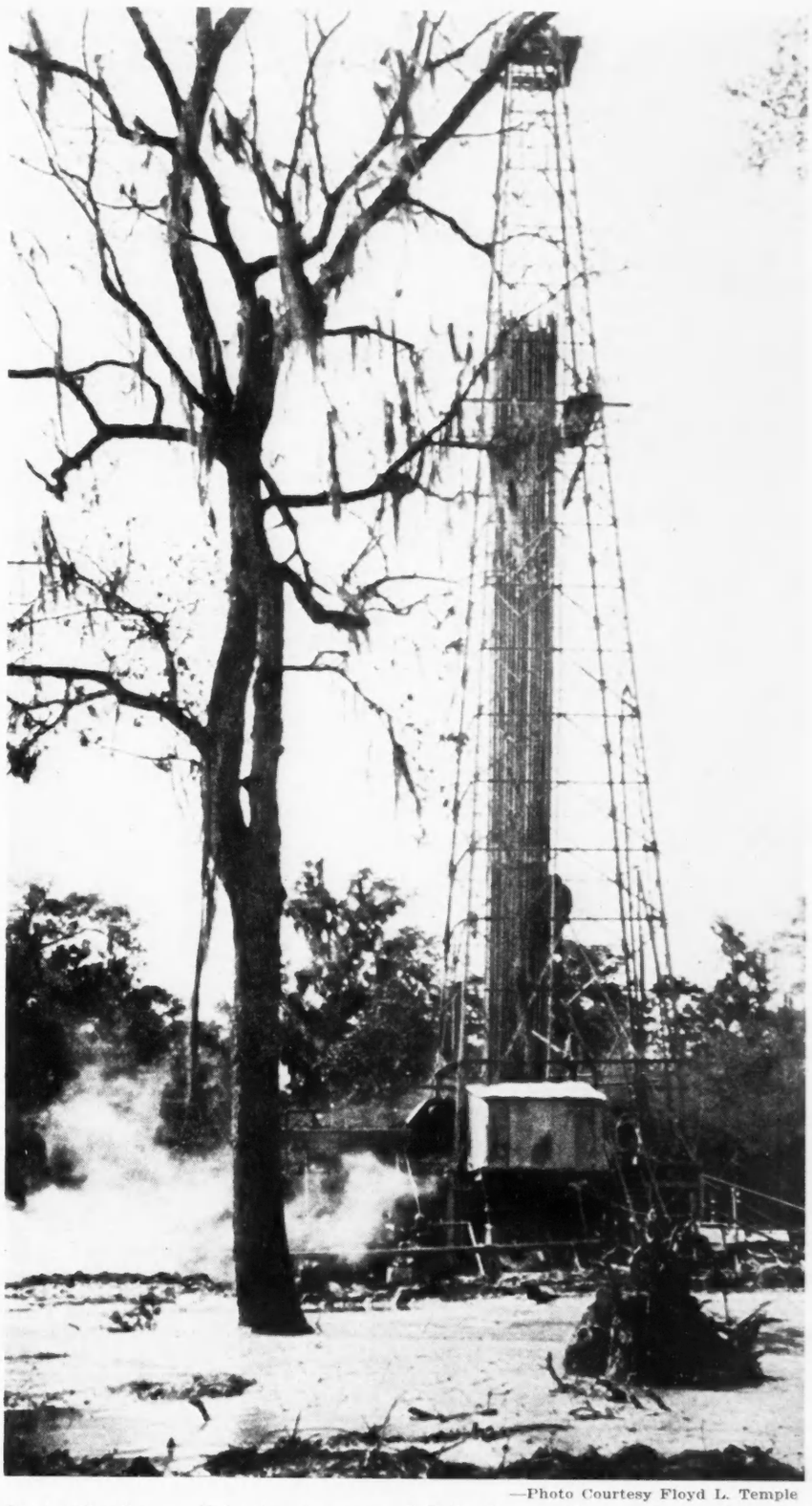
to

Trend

By JOHN D. TODD and
FRANK C. ROPER,
Consulting Geologists

Trend are certain wells that give specific and very valuable information. We know from a deep test at Katy[1] that sand conditions there are not good in the Wilcox at 10,000 foot levels. In another part of northern Harris County[2] we know that the upper sands of the Wilcox appear quite shaley at 10,000-foot horizons. In like manner, much further east, we know that in central Pointe Coupe Parish[3] sand conditions are not good below 10,000 feet, and in northern St. Landry Parish[4] sand conditions were found to be quite tight at below 10,000 feet. From these widely scattered and very meager data, we draw the logical conclusion that sand conditions will generally be bad in this Trend where the horizons are topped at 10,000 feet and that the preferable area for prospecting is probably above the 9000-foot levels. This is a reasonable conclusion but not a necessary one, since unknown conditions might make sand conditions excellent in some localities below 10,000 feet. In most cases our knowledge extends only to the Upper Wilcox sands, and sands deeper in the section might not have been tight.

In like manner, on a few widely scattered data, we do know that these formations bear fresh water for unusually long distances down dip. From a consideration of these facts, we come to the conclusion that on the average the Sparta and Wilcox sands will probably bear fresh water down to their 5000-foot levels. Since oil is formed in the presence of salt water, the only oil which is found above the 5000-foot levels will be that oil which had formed and had been trapped before the formations were flushed with fresh water. Very likely most of the structures have been formed



—Photo Courtesy Floyd L. Temple

Peyton Brothers well in the Ace area of Polk County, Texas, where oil in the Wilcox spurred further the current interest in the possibilities of this formation over a wide trend.

[1] Stanolind Oil & Gas Company's Freeman 1, Harris County, Texas.

[2] Superior Oil Company's Butler 1, Bammel Area, Harris County, Texas.

[3] Batchelor Oil Company's Hackney Lumber Co. 1, Pointe Coupee Parish, Louisiana.

[4] Herton Oil Company's Thistlewaite 1, St. Landry Parish, Louisiana.

since the flushing, so we would expect most of the oil producing traps to be located below the fresh water zone. Our opinion that the formations will be fresh down to 5000-foot levels is by no means final conclusion but rather an interlocutory idea to be used until fuller information is obtained.

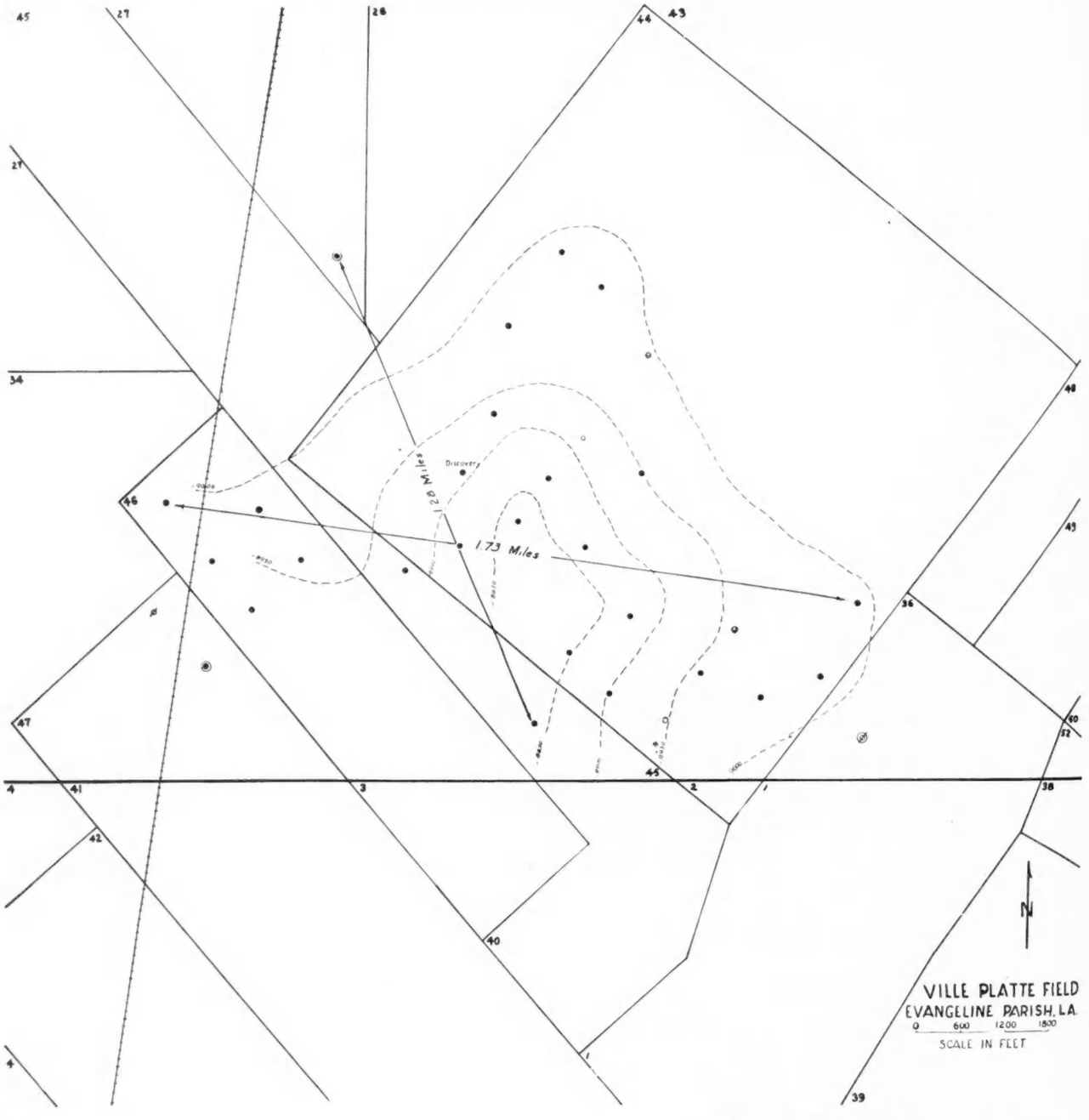
In all statements concerning the formations of the Lower Eocene, it must be kept in mind that our knowledge of the lower facies of these strata is very new and that it is growing very rapidly. Interesting wells are now drilling, and many more wells will be drilled immediately. The information obtained from these wells will confirm or deny many current opinions, so that the mind must be kept clear of predetermined opinions so that we can adapt our thinking to the facts as we learn them. Very little—very, very little—is known about these formations and this trend now, but a few years hence much will have been learned.

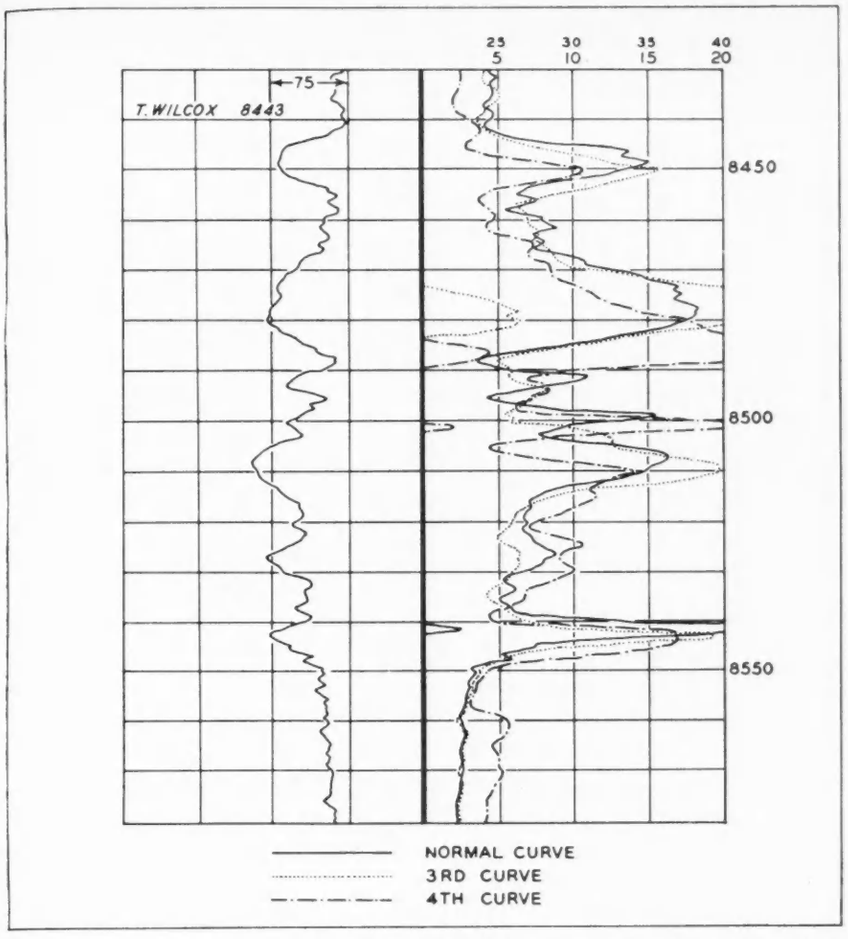
Similarly, as the structures which are now producing from the Sparta and Wilcox horizons are drilled up in coming months, the fields will become delineated both horizontally and vertically.

As we see these fields gradually develop, and digest the facts as we get them, we will learn what to expect of the average field in this trend. Just at present our knowledge is so limited that we do not know what to expect. There are several fields where we have production, but because of the limited extent of the drilling we do not know and have no way of estimating what the ultimate importance of the production will prove to be. This is the case at Segno, Ace, Cleveland and Eola where we now have Wilcox production, and at Cheyneyville where we have Sparta production.

Typical Fields

However, in two fields drilling has proceeded to the point where we know they will be first class oil fields. They resemble each other, in that both are large flat structures. The one is Ville Platte in Evange-





Electrical log of Wilcox section in Richardson's Haas 1, Eola, Avoyelles Parish, Louisiana.

line Parish, Louisiana, which is producing from the Sparta. The other is Joes Lake in Tyler County, Texas, which is producing from the Wilcox. Because we have no other examples we will temporarily assume that Ville Platte is a "typical Sparta oil field," and that Joes Lake is a "typical Wilcox oil field"; and we will briefly sketch the available information on these fields.

The Ville Platte field was discovered in September, 1937. It produces from the Sparta sands at 8900 to 9100 feet. The main producing sand is called the Tate sand and averages around 60 feet in thickness, of which the upper 30 very large gas cap so that on top of the structure it shows only gas and distillate, but makes oil wells on the edge of the field. On the shown plat, the two wells with circles around them are Haas sand wells, the others being Tate sand wells. As appears on this plat, the field is now 1.73 miles in width and 1.28 miles in length, and appears to be destined to be much larger than its present limits. It is estimated that this field will ultimately cover between 2000 and 2500 acres, and has a reserve of 40,000,000 to 50,000,000 barrels.

Joes Lake was discovered in May of 1937, and was the first deep Wilcox production. And that is about all that you can say about it for sure, as it is located entirely on the fee lands of Houston Oil Company and Republic Production Company, and there have been no official releases of information concerning it. However, the Railroad Commission does have the location of the wells and knows their potentials (this much is public knowledge even when you drill a well in your own back yard), and these facts alone are enough to indicate that it is a big thing. From the accompanying map it appears that the breadth of the field already covers nearly two miles, and that the last wells in the field are the highest. By the operator's continuous profile system of drilling (a method borrowed from the 1939 model seismologists) operations are just now under way to determine the length of the field. It is considered that the production at Joes Lake is coming from four sands in the upper Wilcox having an aggregate thickness of about 200 feet. These sands are encountered between 7600 and 7800 feet. The field seems likely to encompass 5000 acres and to have a reserve of not less than 200,000,000 barrels.

From the facts available from these fields, from geophysical data, and from other desultory information, it now appears that the fields of this trend will be large, flat structures which cover much larger areas than most of the Coastal fields. Being large and flat, they will perforce be difficult to find by geophysical means; since being flat it will require the most accurate form of work to recognize them, and being large it will necessitate work over a very large area to delineate them. It is the opinion of the authors probably about 2 percent of the acreage in this trend will prove productive. Just how long it will take to locate the productive portions will depend not only on the forthcoming geophysical advancements, but also on the status of the demand for crude oil which always influences the diligence with which the search for structures is conducted.

Current Developments

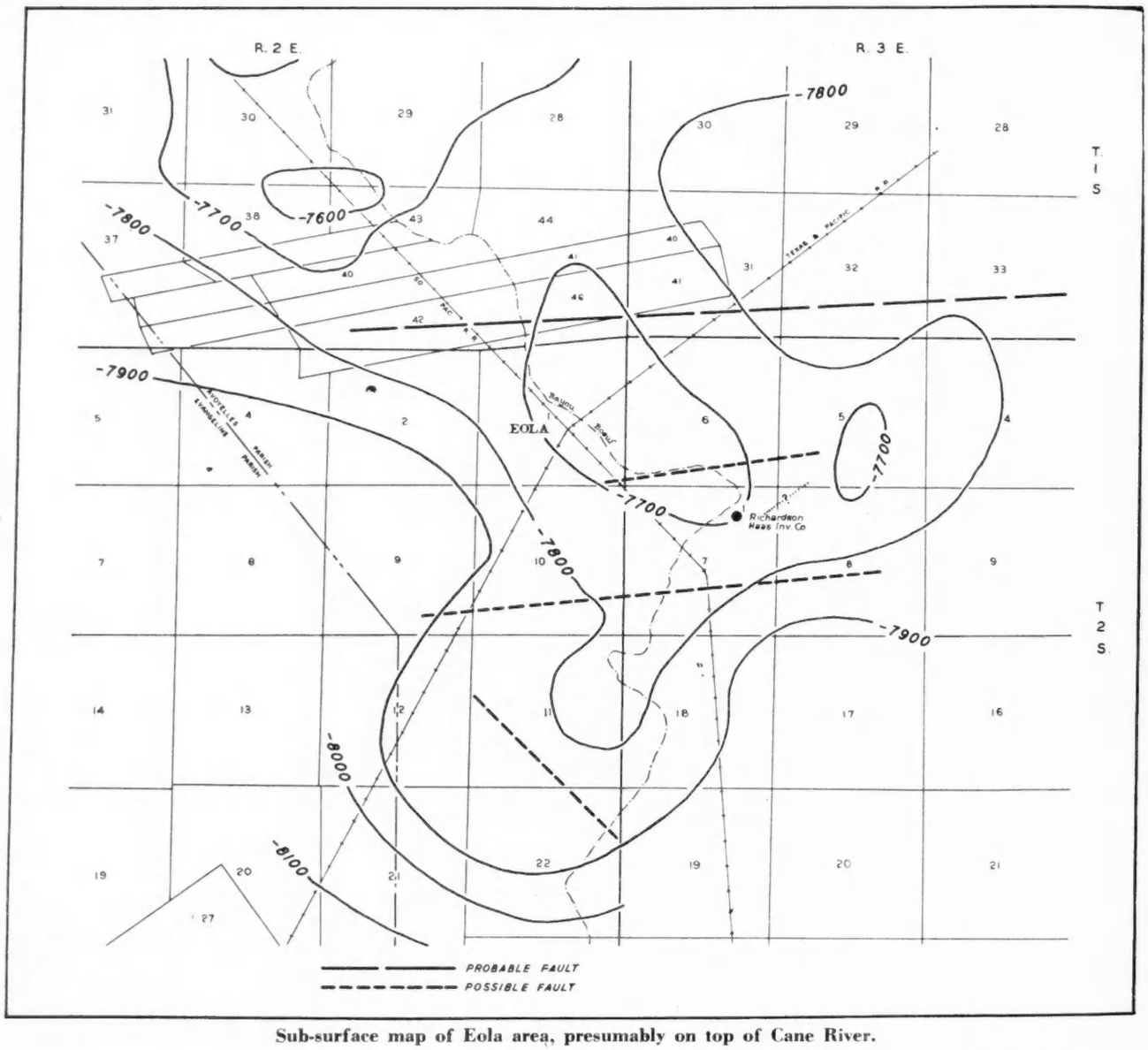
Since the larger integrated companies, with their filling stations, refineries and pipe lines, are actively in touch with the supply and demand conditions of the crude oil market, and since it is the current opinion of those best informed that the supply of available crude oil exceeds the demand, naturally these larger concerns are loath to start exploration campaigns which will further augment the supply of available crude oil. This policy of companies, to make the future reserves await future discovery, coupled with the previous bad repute of this trend accounts for the fact that most of the discoveries in this belt are linked with the names of independent operators (independent in the sense that they are primarily producers of oil for sale in the market as oil, rather than producers of oil for processing and sale in the market as gasoline, kerosene, lubricants, and the various by-products).

Glancing across a discovery sheet, one finds the names, not of major companies, but of petroleum pioneers like J. K. Dorrance, Dick Schwab, Sid Richardson, Houston Oil, Republic Production and Peyton Brothers. In addition to these,

there is a host of other smart, strong, well financed independent operators who have bought leases in the trend and who no doubt at this time have definite development plans. With such an aggregation taking the lead in developing the trend, it is no longer possible for the larger concerns to postpone development. It has now reached the point where they must elect to take definite steps in the trend at once, or to ignore it for several years to come.

Among the recent developments which have focused attention on this trend, is the discovery of Wilcox production at Eola by Sid Richardson. This not only extended proof of prolific Wilcox sands eastward for a hundred miles, but it demonstrated that weak geophysical pictures can prove to be first class oil fields in this trend. Richardson took a burdensome lease, which most operators would have considered prohibitive, on what was thought to be the edge of the Eola structure. His well was expected to be, at best, an edge well; but it now appears to be far above the water contact and may be a top well. While the facts are too few to permit of a definite opinion, it is current belief in well informed circles that his strike at Eola will prove to be a very large field. In any case, it is definitely ascertained that an excellent producing section has been found in his well; as is witnessed by the electrical log of the well, and a reported test of 35 barrels an hour on a ¼-inch choke. Some idea of the type of structure, and probable extent of the field can be gathered from shown subsurface structure map of the area.

Coming on the heels of the Eola discovery, which has produced a rush of leasing and geophysical work on the Louisiana end of the trend, is the news this week that Wilcox production has been found at Ace in Polk County on the west part of the trend. This well, Peyton Brothers' Kirby West Lumber Company C-3, is reported to have cored Wilcox sand, with some sandy shale from 7748 to 7787. The well made 20 stands of oil on drill stem test, and the section showed up excellently on electrical log; casing is now being set, and barring mechanical difficulties it is considered a sure bet for production. This well will extend the west limits of Wilcox production about 10 miles, the nearest Wilcox production being at Segno. The Peyton Brothers are large and successful independent operators from Mexia, Texas, who have been active operators throughout East Texas.



Sub-surface map of Eola area, presumably on top of Cane River.

Production Characteristics of Some Typical Distillate Fields in the Gulf Coast Region

Due to variations in nature of contents it is important that detailed studies be made of the producing characteristics of these deep fields if they are to be operated on efficient basis

By L. S. REID, Black, Sivalls and Bryson, Inc.
and
R. L. HUNTINGTON, University of Oklahoma

THE development of many new deep fields in Texas and Louisiana has been retarded on account of the predominance of high gas-distillate ratios under which the wells in these fields necessarily must be produced. In the absence of a market outlet for the excessive volumes of gas which would have to be produced in order to recover a sufficient quantity of distillate to make such operations economical, it has been obligatory that these fields be shut-in for the time being to prevent waste and abnormal pressure decline. It appears that the only other alternative for securing returns from these fields is to recycle the gas, which is produced with the high gravity distillate, back into the formation through recompression. The expense of this process, however, could not be justified in some cases were the conservation of the gas is the only desirable result obtained.

Both laboratory and field data provide evidence that most of these deep reservoirs contain a single phase fluid, (ordinarily thought of as a vapor or a gas) under the initially high pressures which exist at the time of discovery and in the early life of these pools. By holding a high pressure within the reservoir, a single homogeneous fluid phase can be maintained, thereby making it possible to produce a reservoir to depletion with a 160 to 640 acre spacing where, for example, 10 to 40 acres might be considered the most economical spacing for each well in an ordinary oil field.

Should the pressure be lowered appreciably in these so-called "distillate" reservoirs, retrograde condensation would take place with the result that the sand grains would become wetted with the condensate. While the volume of distillate so condensed in the reservoir would be of sufficient magnitude to constitute a severe economic loss, when compared to the pore volume of the resrvoir, this condensate volume would not be sufficient to form a liquid level in the formation, and hence, could not be recovered easily. Although recycling of dry gas might act as a denuding or stripping agent on any liquefied hydrocarbons, it is extremely unlikely that this method of recovery could be accomplished in an economical manner. A study of the distillate loss resulting from rapid pressure decline in the La Blanca field has been presented recently by Patton and Ivey[4] of the Texas Railroad Commission. This information emphasizes the importance and necessity of gas recycling and pressure maintenance to the realization of a high ultimate distillate recovery in fields of this type.

Variations in Distillate Content in Gulf Coast Fields

The economic feasibility of a gas recycling project is based upon the market price of "distillate" and the

TABLE 1

Composite Reservoir Fluid Analyses from Three Distillate Fields in Texas

HYDROCARBON	RESERVOIR No. 1		RESERVOIR No. 2		RESERVOIR No. 3	
	Mol Percent	Gal./ Mcf.	Mol Percent	Gal./ Mcf.	Mol Percent	Gal./ Mcf.
Methane	91.70	.....	93.28	.....	95.00	.....
Ethane	3.04	.....	2.49	.....	2.65	.....
Propane	1.83	.....	1.25	.....	0.34	.....
Iso-butane	0.25	0.415	0.05	0.258	0.18	0.176
Normal-Butane	1.05		0.76		0.37	
Iso-Pentane	0.15	0.238	.....	.....	.....	.....
Normal Pentane	0.51		0.43		0.13	
Hexane and heavier	1.47	0.735	1.74	0.871	1.33	0.666
Total	100.00	1.388	100.00	1.285	100.00	0.889
Gas/Oil Ratio Based on Butanes +	30,200		32,650		47,300	
Vapor Pressure at 100° F (C_4 +)	16.30 Lb./Sq. In. Abs		11.18 Lb./In. ²Abs.		11.04 Lb./In. ²Abs.	

gas-distillate ratios which attend its production. A high price might make it profitable to recycle with gas-distillate ratios as high as 100,000 cubic feet per barrel; however, under present conditions, ratios of not more than 50,000 cubic feet per barrel are being given serious consideration.

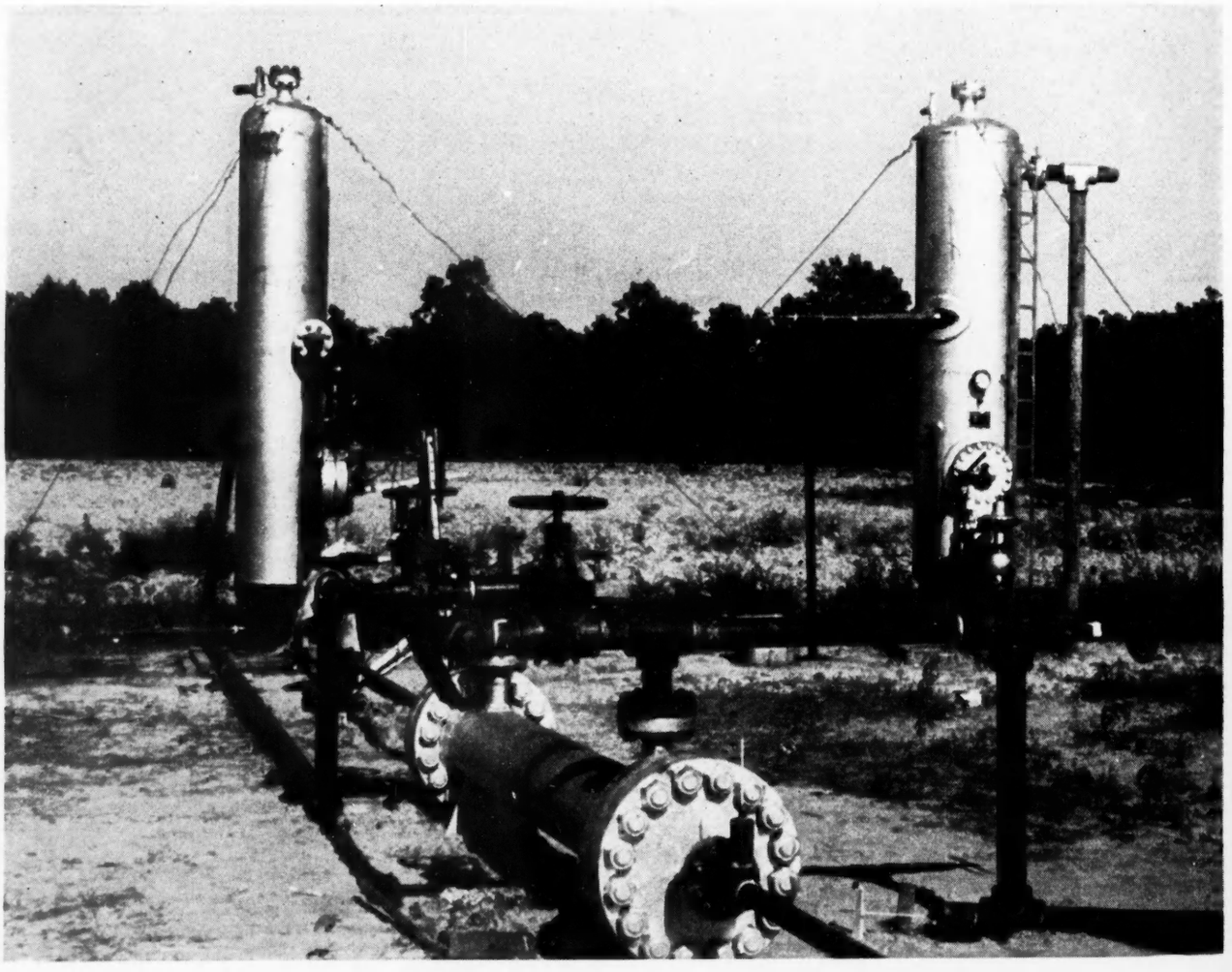
An idea of the variation in distillate content may be gained from the following analyses of the composite reservoir fluids from three typical fields scattered over a wide area in Texas, as shown in Table I.

Equilibrium Vaporization Data at 1000 Pounds per Square Inch Gage and 90° F.

When the well stream from Reservoir No. 2 was passed through a separator at 1000 pounds per square inch gage and at 90° F., the gas/oil ratio was 43,000 standard cubic feet per barrel of liquid accumulated at that pressure. The analyses of the gas and liquid streams coming from the separator are shown in Table 2.

With the exception of the propane constant, the "K" values agree fairly well with those reported by Katz and Hachmuth[2], whose data represents the average values obtained through an exhaustive study of Oklahoma City crude oil and gas. It might be added, however, that these equilibrium vaporization constants are not neces-

View of Commercial Size Stage Separation Installation on which a portion of the data was obtained.



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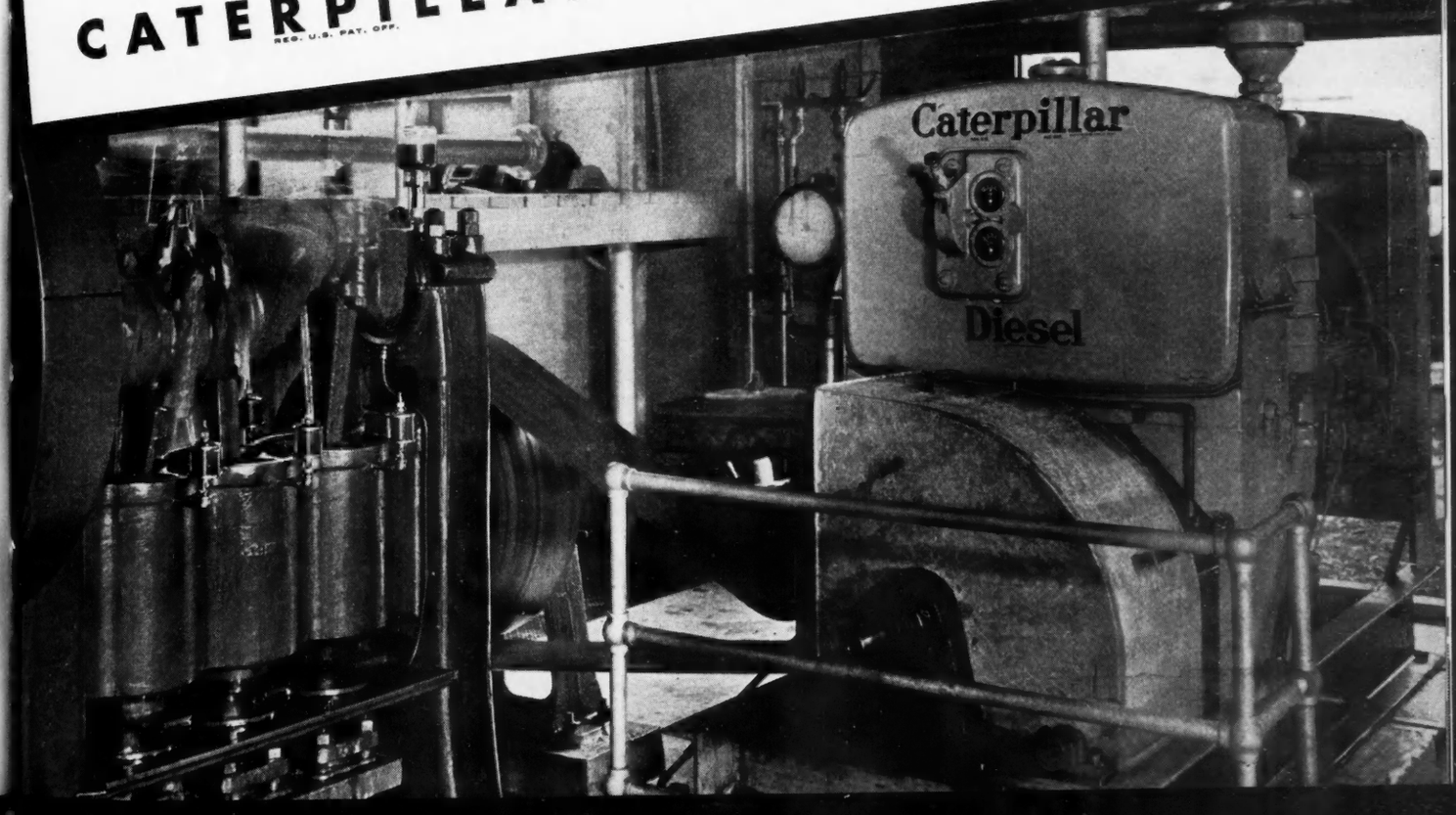

sarily a function of temperature and pressure alone, but also depend upon the nature of the mixture and the relative proportions of the hydrocarbons which make up the particular two phase system. There is a definite need for more of these vaporization data in order to clarify the behavior of the fluids within these high pressure reservoirs.

Stage Separation—Distillate Accumulation

In order to take full advantage of the retrograde phenomena, it is necessary to separate the gas and condensate at relatively high pressures. As a result of employing such high pressures, the high content of methane, ethane and propane dissolved in the separator liquid (for example see Table 2) presents a problem of stabilizing this liquid to atmospheric storage conditions. However, as will be shown later, loss of heavier hydrocarbons resulting from the stripping action of these components, when subjected to flash vaporization, can be effectively minimized by reducing the pressure in a stepwise manner, commonly termed "stage separation."

TABLE 2

Vapor and Liquid Separator Samples from Reservoir No. 2
(Separator at 1000 lbs. Gauge and 90° F.)

COMPONENT		Vapor Mol Percent	Liquid Mol Percent	$K = \frac{\text{Mol Fraction in Vapor } y}{\text{Mol Fraction in Liquid } x}$ Observed	$K = \frac{y}{x}$ Katz & Hachmuth
Methane	C_1	94.95	31.98	2.97	4.3
Ethane	C_2	2.46	3.65	.68	0.92
Propane	C_3	1.23	1.81	.68	0.35
Iso-Butane	IC_4	.04	.33	.12	0.15 Butanes
N Butane	NC_4	.65	4.90	.13	
Pentanes	I & NC_5	.21	8.61	.024	0.06
Hexanes and heavier	C_6+	.46	48.72	.01	0.028 (C_6 only) 0.016 (C_7 only)
		100.00	100.00		

The well stream from Reservoir No. 2 was passed through both commercial-size and small scale experimental stage separation hookups in which the accumulation of distillate was measured as the pressure was varied from 1200 pounds down to 800 pounds per square inch gage on the initial high-pressure stage. Tests through this pressure range were repeated under constant temperatures of 70°F. 80°F. and 90°F., respectively. The results of these tests are shown in Figure 1. One thousand pounds per square inch gage was the most favorable pressure for the accumulation of distillate and the lower the temperature, the greater was the volume of liquid condensed at this pressure.

This pressure, at which a maximum liquid accumulation is obtained for any given temperature, is that point at which the cumulative effects of both normal and retrograde condensation of the various hydrocarbons in the system reach a maximum. Correlation of the results of a number of well tests indicates that this pressure of maximum accumulation is a function of the composition of the reservoir fluid. In the majority of pools tested to date, this pressure has been found to range from 800 to 1200 pounds per square inch although, in a few cases where the distillate content of the reservoir fluid was relatively high, optimum

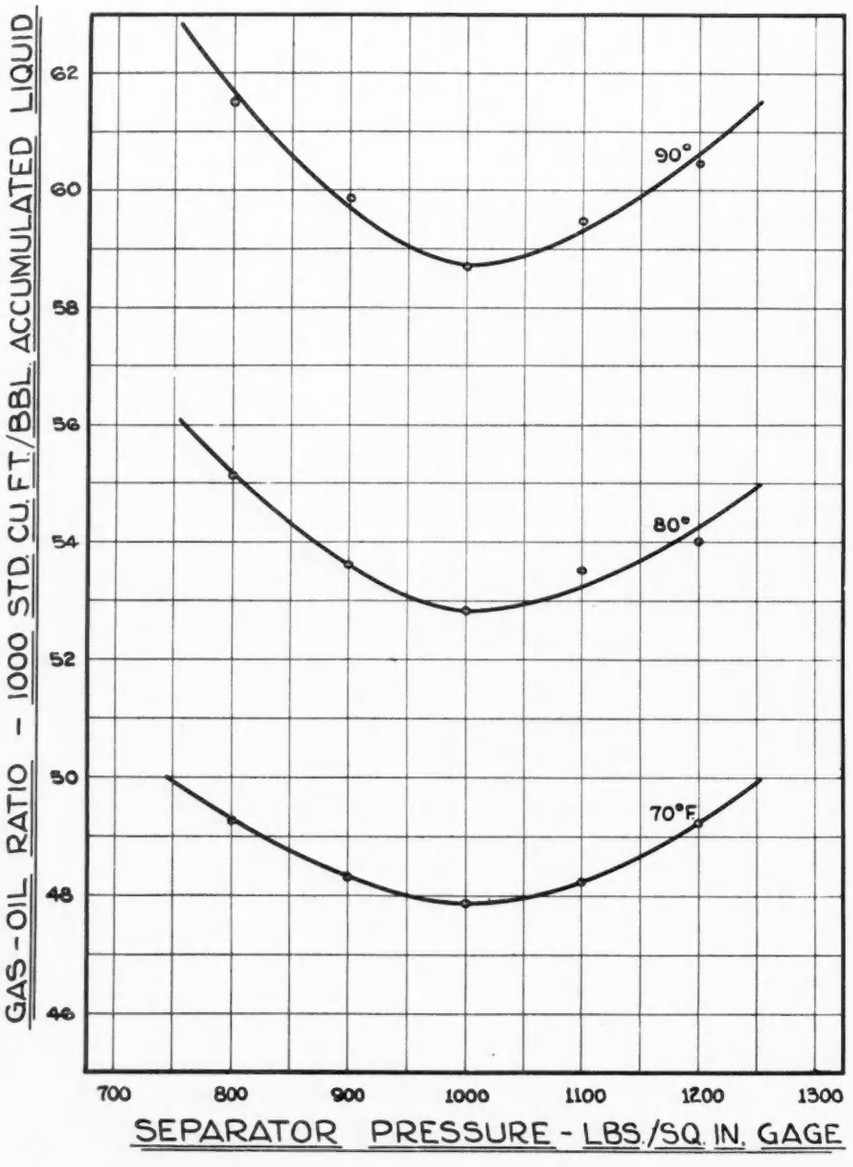

FIGURE 1

Effect of first stage separator temperature and pressure on Gas/Oil ratio.

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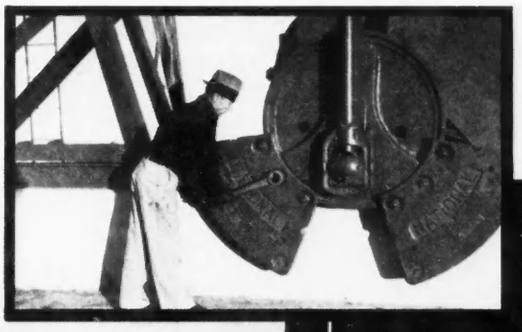

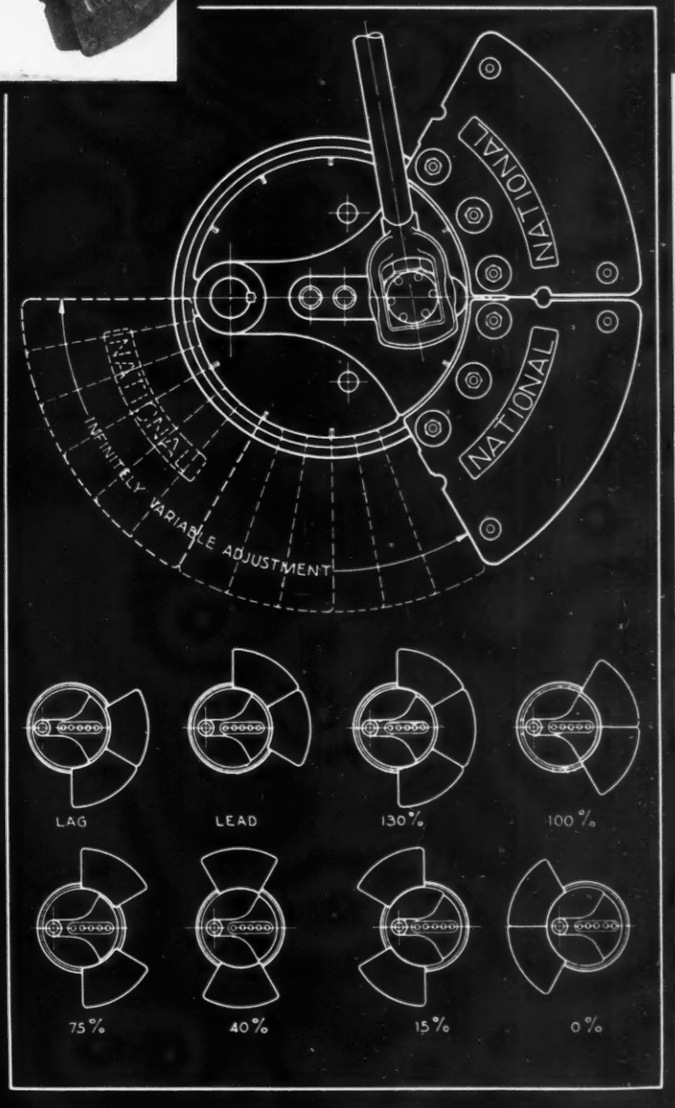

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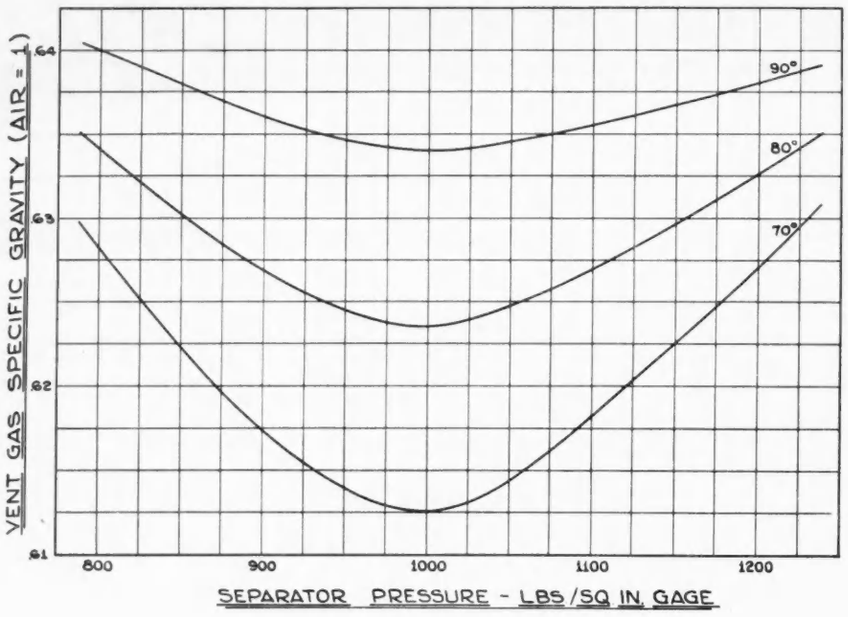


FIGURE 2

First stage residue gas densities as a function of temperature and pressure. (Samples taken from initial high pressure separator.) (Cross plat of original data.)

pressures in the order of 1600 to 1800 pounds have been observed.

From an economic standpoint separating at pressures in excess of the indicated optimum pressure might be preferable since, at these elevated pressures, the cost of compressing the residue gas to the required injection pressure would be so much lower that it would outweigh the decreased distillate recovery which would result from operating the first stage separator at higher pressures. This decrease in recovery could be compensated, to some extent, by operating at lower temperatures. This lower temperature limit is determined by the freezing temperature of gas-hydrates.

It is unfortunate that the freezing points for gas-hydrates vary directly with the pressure.[1]

Properties of Residual Gas

Figures 2 and 3 represent data taken at the same time as those shown in Figure 1. Since 1000 pounds per square inch gage pressure resulted in maximum liquid accumulation, in this particular case, it is only logical that the residual gas in contact with the liquid at this pressure should exhibit lower specific gravity and lower gasoline content than at either higher or lower pressures. Gas specific gravity data are presented in Figure 2 in the form of a cross plat of the observed data in order to show the effects of temperature to better advantage.

The observed data are presented as a cross-plat in Figure 3 and show the influence of low temperature operation on the gasoline content of the residual gas. Here, the gasoline content is shown to double itself between 60° and 100° F. in the 800 to 1000 pound pressure range. Still lower temperatures might result in drier gas; however the difficulties to be incurred through freeze-ups resulting from the freezing of gas-hydrates are apt to make operation at 60°F. or higher the temperature range to be selected in this case.

Distillate Recovery at Atmospheric Pressure

The producer is not interested, from a dollar and cents viewpoint, in the accumulation of liquid in the high-pressure separator but he does want to know how much salable product will be recovered at storage conditions. By flashing the liquid, accumulated at high pressure, directly to atmospheric pressure, (as would be the case where the liquid contents of a separator operating at 1000 or 1200 pounds per inch dumped directly into the stock tank) the experimental data indicate that the recovered liquid volume would be a minimum.

The recoveries resulting from this single flash type of operation

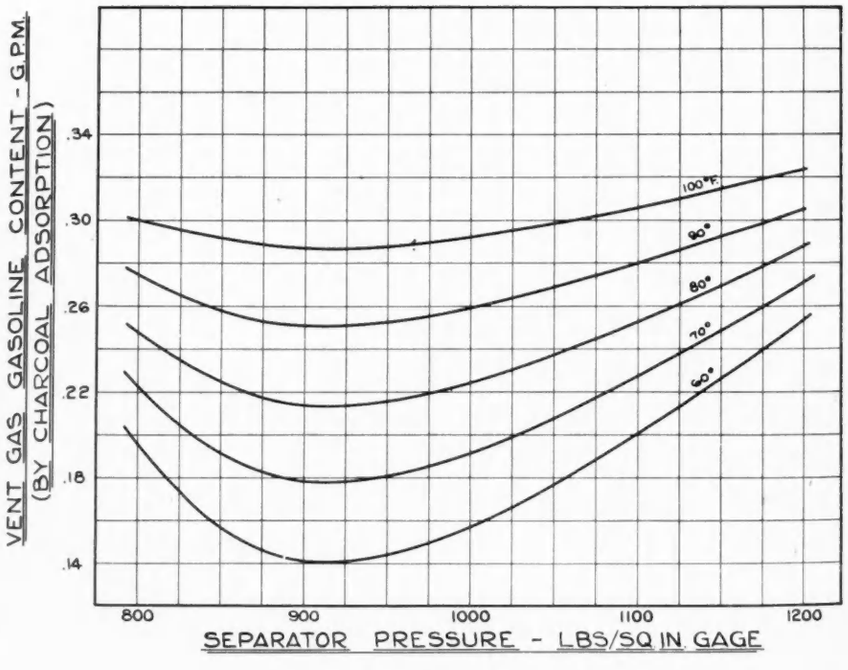
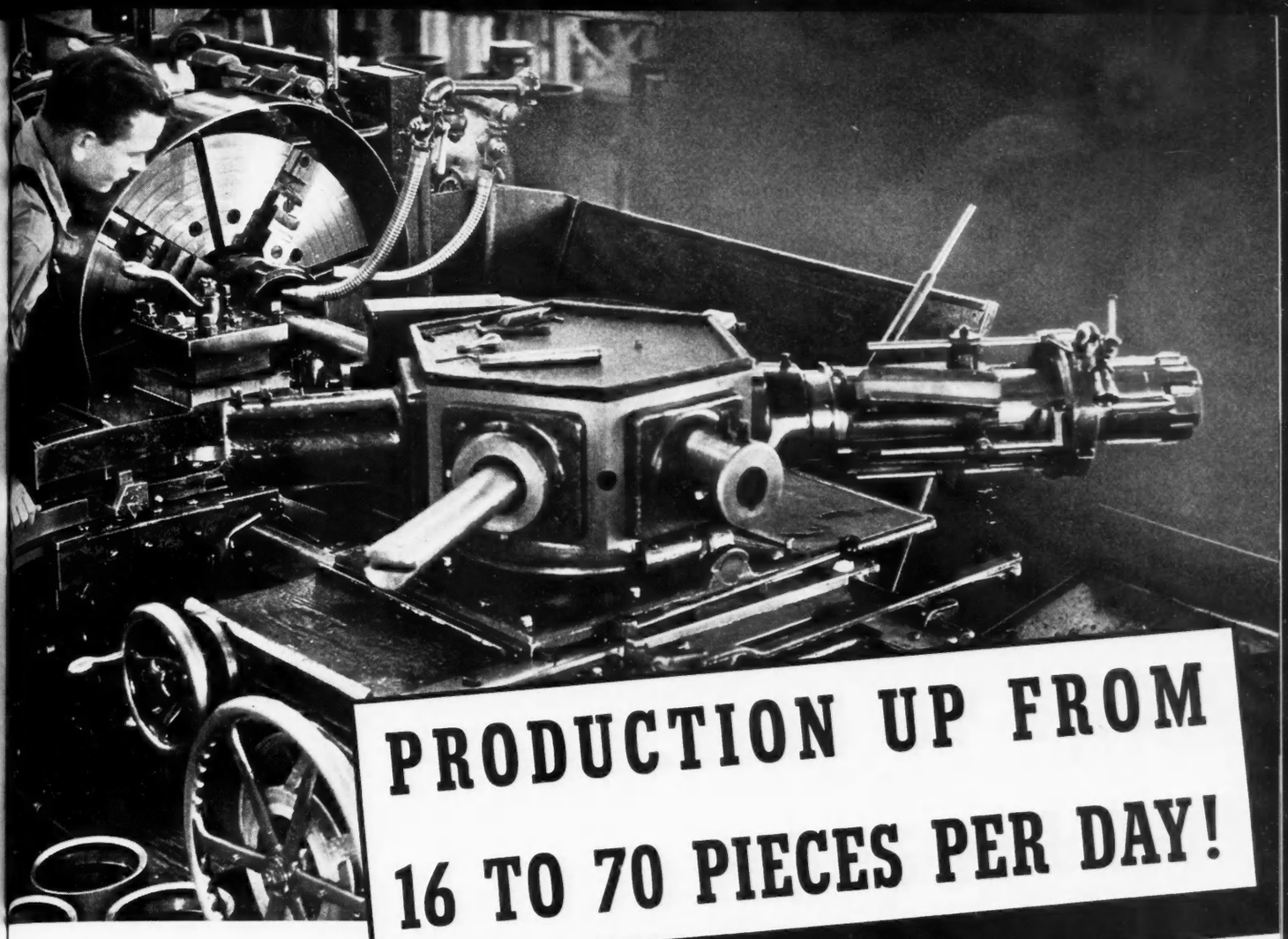


FIGURE 3

Gasoline content of first stage residue gas—its relationship to temperature and pressure. (Cross plat of original data.)



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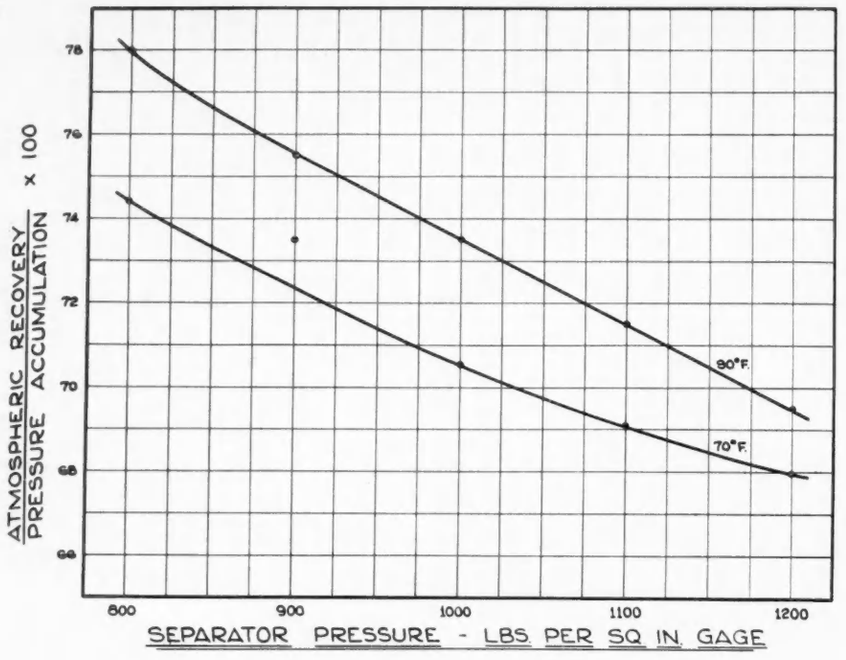

FIGURE 4

Volumetric relationship of stable recovery at atmospheric pressure versus liquid accumulation at indicated pressures and temperatures.

are shown in Figure 4, where the ratio of the volume of recovered distillate to the volume of liquid accumulated under pressure is plotted vs. the accumulation pressure under constant temperature conditions at 70° F. and 90° F.

Recoveries from Different Types of Stage Separation

Kimmell and Huntington[3] have recently reported original laboratory data which show how increased recoveries may be obtained from stage separation. Again the great advantage of stage separation over the use of a single separator is shown in Figure 5 where the distillate recoveries resulting from the two types of operation are compared to recovery obtained by high flash to atmosphere. The further increase in recovery of approximately 4 percent by the use of 30 pound pressure storage in conjunction with stage separation may or may not warrant the additional investment. Usually, the use of pressure storage is dependent upon the distillate price structure, pipe line connections and a ready market for such a high vapor pressure product.

The Engler distillation of a sample of distillate from Reservoir No. 2 obtained by three stage separation from 1000 pounds per square inch gauge down to atmospheric pressure at 70° F. is as follows:

%	(°F.)
Initial	110
5	142
10	162
20	190
30	208
40	228
50	248
60	270
70	300
80	342
90	434
End Pt.	492
Recovery	93.5
Residue	1.5
Loss	5.0

Gravity = 62.4° A.P.I. at 60° F.

These data are presented in order to stress the importance of determining the productive characteristics of distillate wells which might be incorporated into a gas recycling project. A detailed study of these characteristics, obtained from tests, will enable these wells to be produced for maximum distillate recovery and an optimum return on the investment. Almost invariably, such an analysis will prove the feasibility and economic desirability of separating at elevated pressures, with the subsequent stabilization of the distillate product to storage conditions by means of multi-stage separation.

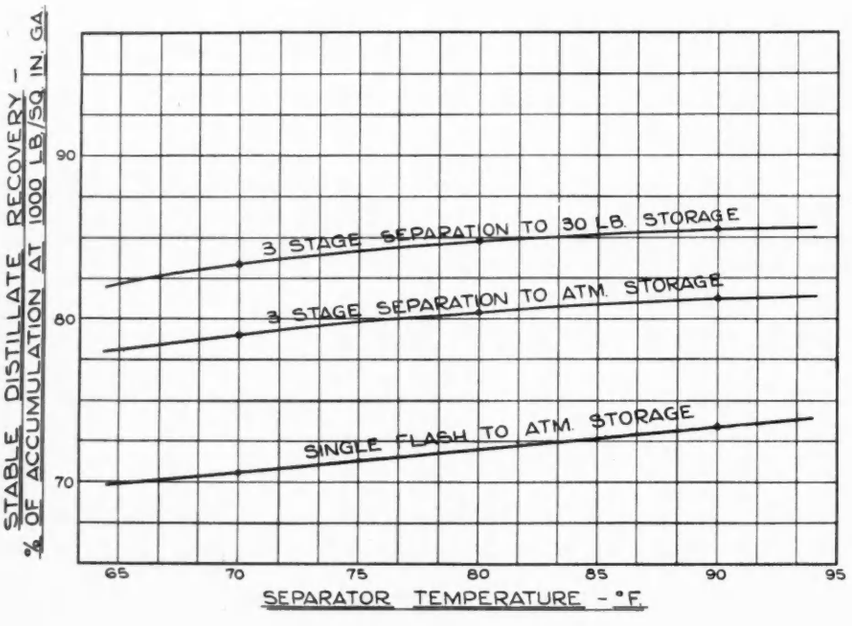

FIGURE 5

Comparison of Recoveries from Several Stage Separation Systems.

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[1] Hammerschmidt, Ind. and Eng. Chem., Dec., 1934.

[2] Katz, D. L., and Hachmuth, Ibid. 29, 1072 (1937); also Pet. Dev. and Tech. A.I.M.E. 1938.

[3] Kimmel and Huntington, The Oil Weekly, Oct. 17, 1938.

[4] Patton and Ivey, The Oil Weekly, Dec. 12, 1938.

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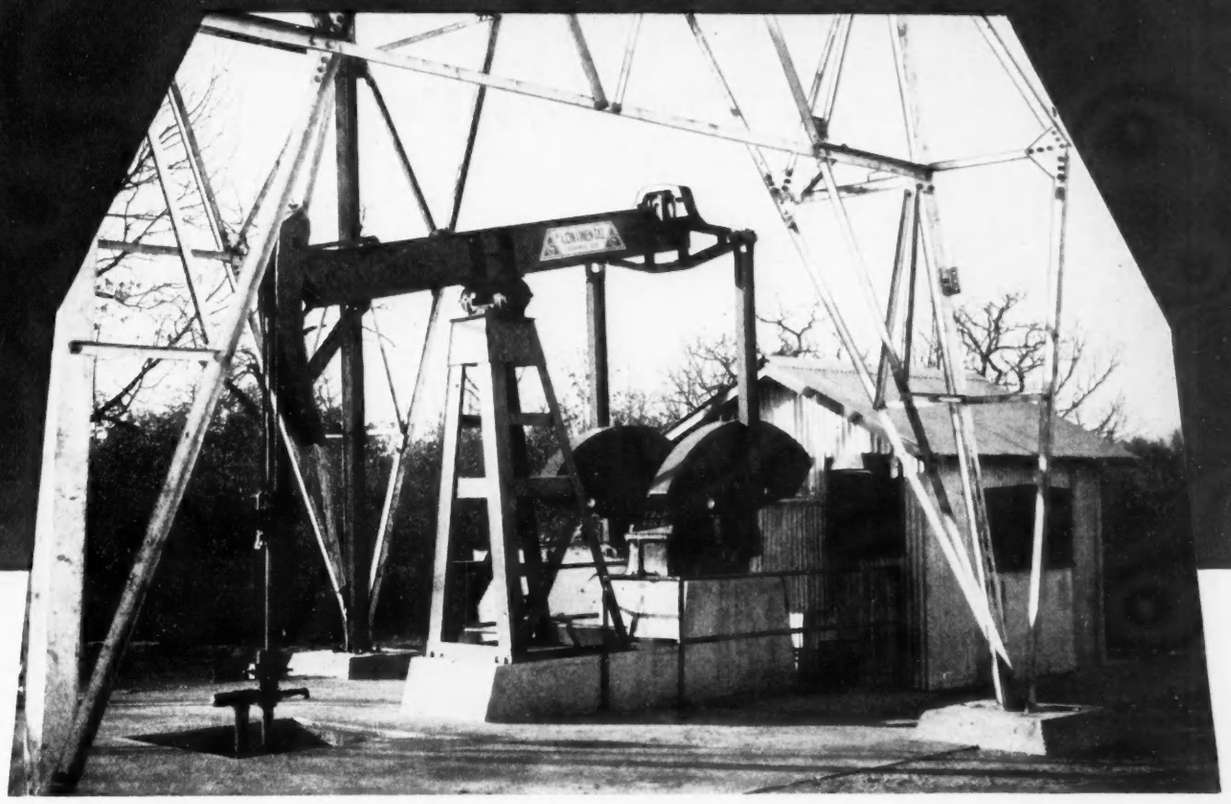

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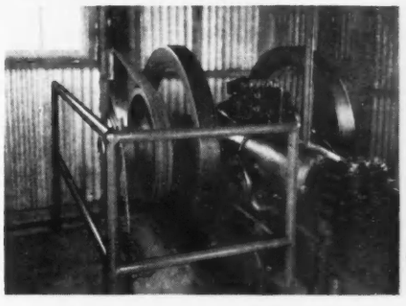

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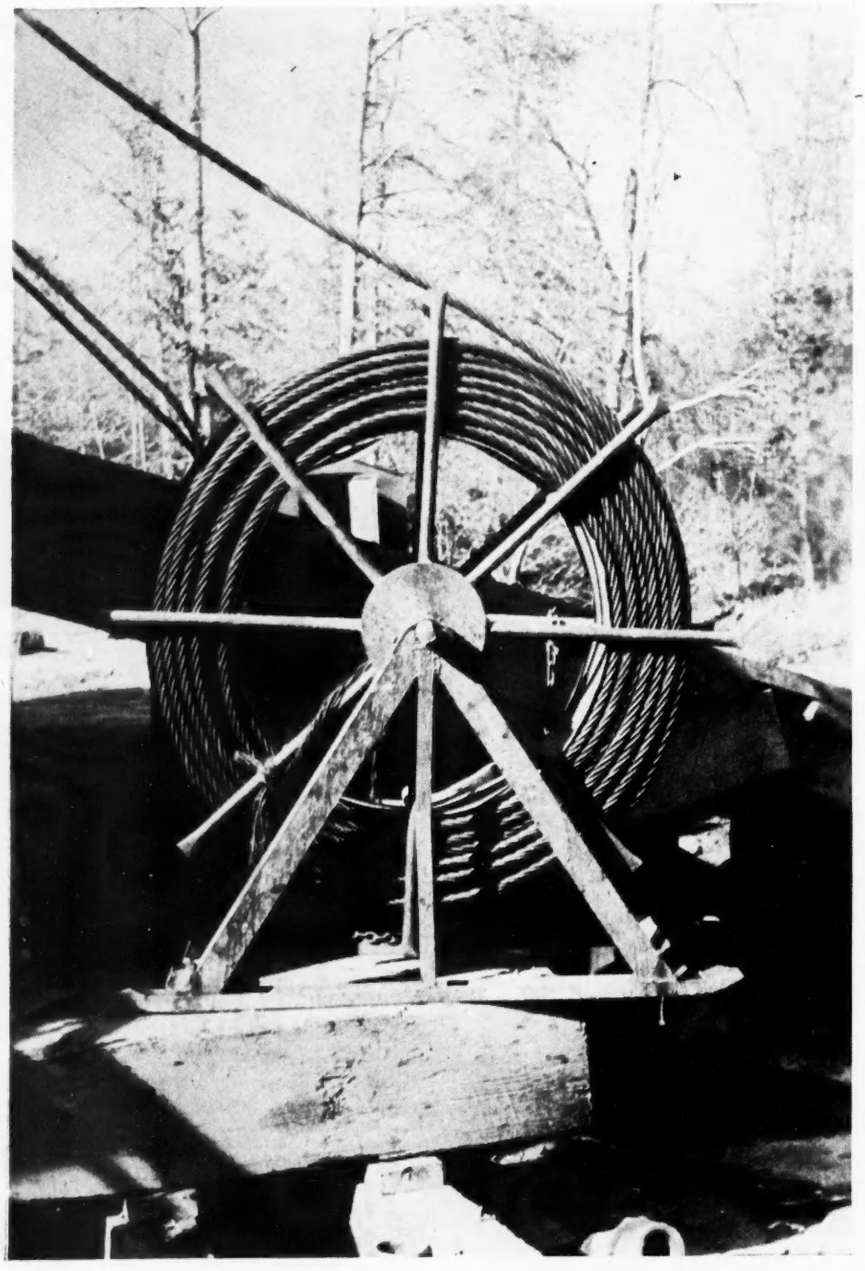
Drilling Footage Costs Cut By Special Wire Line Procedure

By CLAUDE JOHNSTON, General Superintendent, Delta Drilling Company



WITH an average drilling time for the 7700-foot wells in the Schuler field of from 45 to 50 days, drilling line costs operators approximately $20 per day under usual practice of buying a 1250-foot line and reversing it once during progress on the well, meanwhile cutting off damaged ends as they become unsafe for further use. This figure is arrived at by taking the price of $850 for a line of the usual length, assuming that the driller uses 1⅛-inch line, preformed, and with independent wire core.

Such a line with ordinary care and used over sheaves in good condition, will just about last for the average well, without sufficient service left over to justify its use when rigging up to start the next hole. On this basis, the wire line cost per foot of hole is 10.9 cents, with no salvage value to apply as reduction in line cost.

Delta Drilling Company, pioneer in the Schuler field and at present operating more than half a dozen rigs in that territory, also pioneered an innovation in drilling line practice which has cut the per-foot cost from the figure quoted to slightly under 3¾ cents per foot of hole made.

Instead of buying the usual 1250-foot line, Delta buys a 2000-foot line, and uses one end of the line for start-

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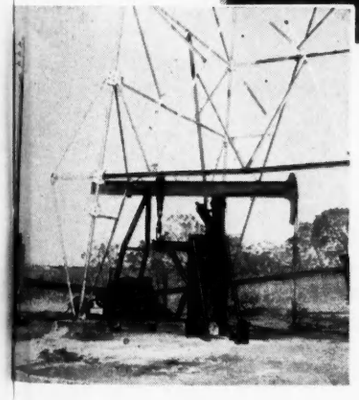

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ing a well. As work progresses, this line is fed through the rig to distribute drum and sheave wear. Control of the free or unused end of the line is secured through having it wound onto a storage reel, conveniently mounted on extended pieces of blocking under the weight-indicator corner of the derrick. This reel is provided with a friction brake sufficient to require some little effort to unreel the line— this precaution being taken to prevent accidental unreeling of the new line and possible kinking or other damage.

From the reel the line feeds up onto the derrick floor, passing through jaws of a screw clamp (formed to fit accurately to the cable twist without jamming strands or mashing individual wires), then making two or three complete turns around a drum equal to or greater in diameter than the sheaves over which the line is destined to work. This drum is provided with a friction lock and also a positive fastening device so that the end of the cable is firmly secured without distortion or cramping.

As new line is carried through the sheaves and onto the drum, it is necessary only to release the screw clamp and adjust the tension on the locking drum until the desired amount of line has been carried over from dead storage on the big reel to live service on the falls. Utilization of this clamp and drum simplifies the line shifts, and adds appreciably to the life of the cable as it is put into service.

As drilling progresses, and new line gradually replaces that already seeing service, the ends of the line are exchanged, the new wire being carried through travelling and crown blocks and the end attached to the hoisting drum; meanwhile the former live end is stored on the reel below the derrick floor, and again the process of adding short sections or increments of new line is gone through until eventually, after drilling three wells, both ends have been used to the limit of their service life —in their present shape.

Calculating from this basis, the new line, costing $1300, has given a drilling line cost of only $433 per well, as against the cost of approximately twice that amount when using the 1250-foot line.

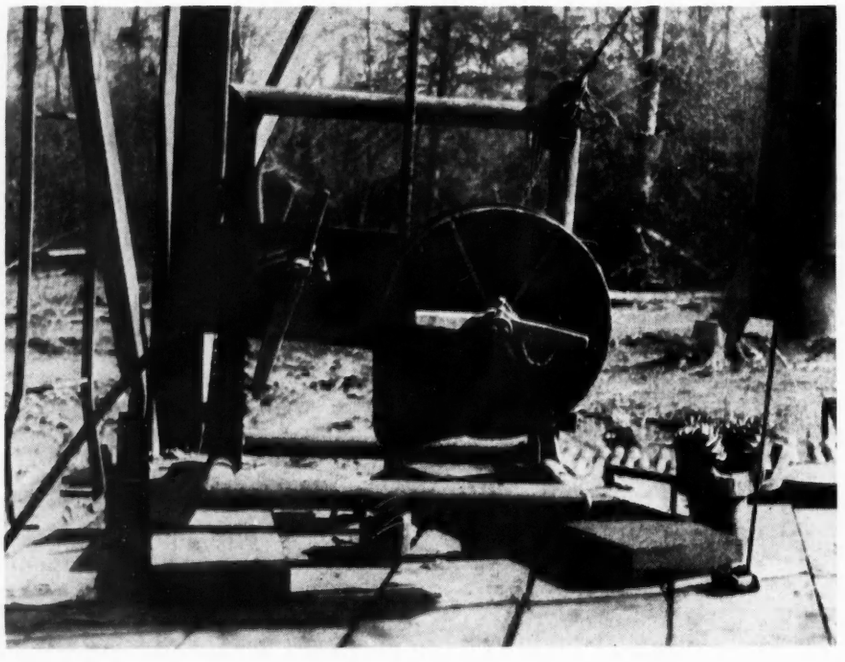
Since, however, the most severe service is borne at the ends of the line, and the center portion still has many hours of service available, Delta takes two of the long lines after their three-well run, and by splicing together the good sections, at a splicing cost of $50 for the two splices necessary, has another 2000-foot line which in turn will make three holes before its service life is exhausted. Since this "new" or spliced line has cost the drilling company only the amount expended on the splices, the drilling line cost for four and one-half wells— the holes drilled with the spliced line being credited half to each of the original 2000-foot lines spliced to form the new line—the line cost of $1350 is divided between 4.5 wells and shows a line cost of only $300 per well, or under 3.75 cents per foot of average hole.

Splicing of the drill lines is done by a wire-line expert, and is so accurately done that there is a standing offer of no pay if the splice can be detected after the job is completed and the line delivered to the drilling rig.

Following service on three wells after splicing, the damaged ends of the line are cut off, and the still serviceable center section shipped to the company's operations in East Texas and other fields where drilling conditions do not demand a line as large as 1¼-inch, and where the loads met are much less than those carried when nearing the bottom of a 7700-foot hole in the Schuler field.

Exchange of ends on the drum, when using the 2000-foot line, does not require re-reeving of the lines, the exchange being effected by power, simply by carrying the line the required number of turns around the drum, and connecting the two free ends through a "come-on", by means of which the line leaving the blocks carries the entering end of the new section through with it. Whenever possible, of course, exchange of line ends is made when changing other equipment, but may be done with but slight loss of drilling time whenever conditions seem to warrant.

By following the procedure outlined, Delta Drilling is able to book a saving on drilling line cost of at least $500 per well—in the Schuler field—as against former costs using the shorter length.



Clamp and three-wrap tension drum used for feeding off new wire line as needed, which eliminates use of cramping clamps and possible damage to the line

Safe Blow-Out Prevention Practices Result from Consistent Drilling Operations

By JAMES I. POWELL, Safety Engineer

PART 1

THE seemingly ever mounting list of fatalities which are attributable to high-pressure gas blow-outs has now, as never before, emphasized a need for more concerted efforts to be directed toward a practical solution of the causes for such catastrophes.

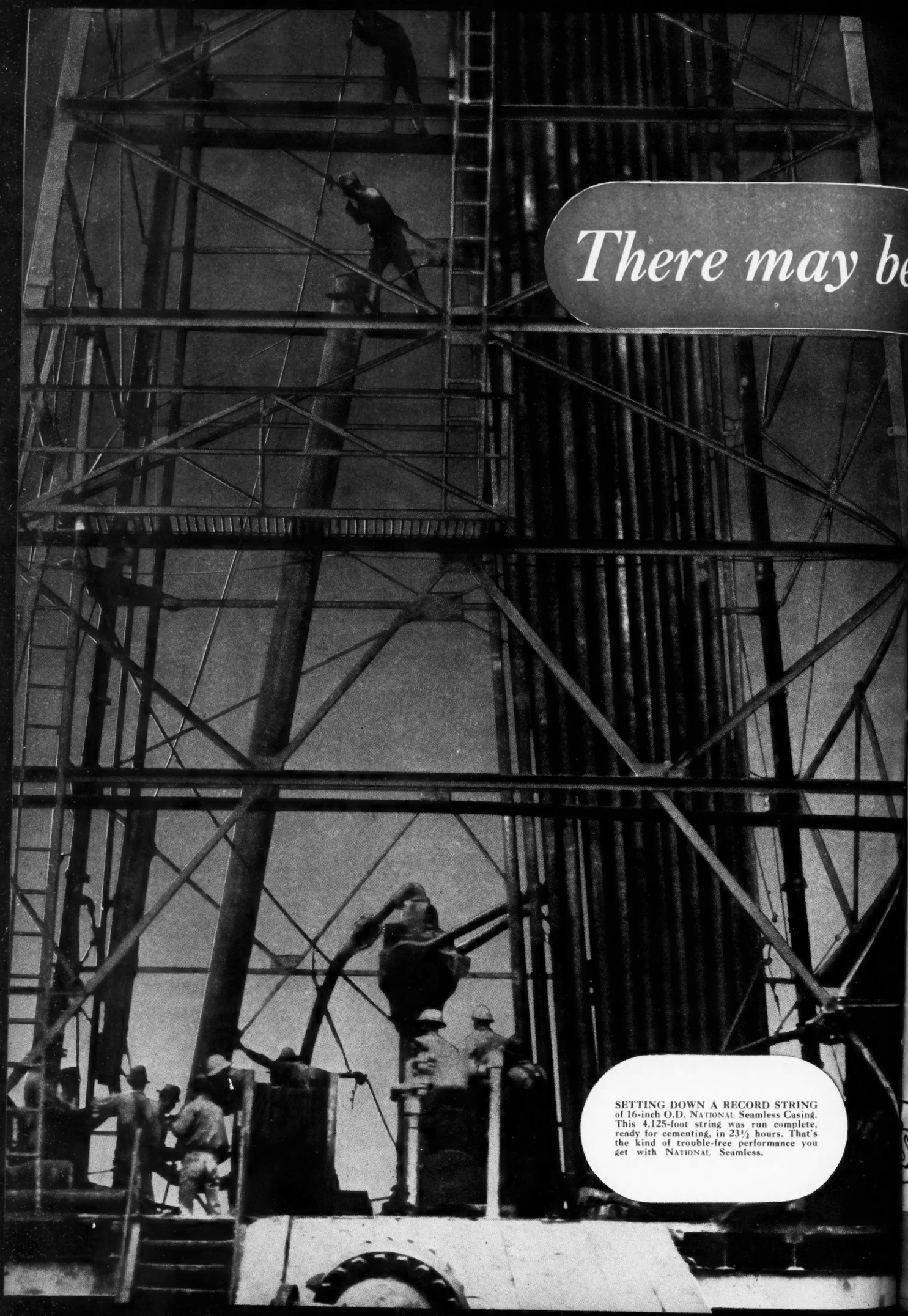
The problem is not one of safety significance alone, but it is encompassed by many phases of the managerial and economic problems as well. However, in viewing the problem strictly from a safety viewpoint, it reduces itself to a practical one wherein the actual existing conditions and the thoughts and acts of the men who are engaged in the supervision and drilling of an oil well are concerned. In other words, very little enlightenment could be expected to be added to our present progressive safety measures which are designed for men with practical minds unless the subject be confined within the realm of the acts that are executed during the course of drilling an oil well.

IT is best that one have some definite procedure firmly established within his mind before an attempt is made to emphasize the importance of the many detailed performances with which one must be concerned in the drilling of an oil well and the prevention of high-pressure gas blow-outs therefrom. Therefore, by way of an analogous explanation, let us for the moment briefly summarize a well proven procedure of a profession whose outstanding success has been founded upon its member's capacity and willingness to study the relationships that exist between apparent trivial details.

There is, perhaps, no other form of human activity more highly organized on a scientific plane than is the medical profession. And in comparison, their tasks coincide with the safety movement in the respect that the aims of both are ultimately concerned with the saving of human lives. The doctor's problem presents itself in the form of a patient who, in turn, registers his personal views, and complaints relative to some personal ailment or injury, whether or not it be of major or minor significance. The patient who, in most instances, is unfamiliar with the functions and purposes of all the vital organs, the nervous and circulatory systems of the human body, can do no more than direct the doctor's attention to the area in which the ailment or injury is the more acute. The solution then rests with the doctor's long years of study, training and experience, which enables the doctor to know that what a patient may believe to be an ailment confined to a certain area, may, in reality, be merely the result of an improperly functioning organ in some other greatly removed portion of the body.

Moreover, were it not for the systematic manner in which the members of the medical profession study the most minute details of their problems and record their findings, their brother members might not have this advantage of proved experiences and each doctor would have to experiment alone to arrive at the solutions. Thus, if the doctor were dependent upon merely the knowledge gained from his own personal experiences, the profession as a whole would indeed have made a very poor showing as a contributor to the welfare of mankind. Whereas, on the other hand, we cannot refrain from offering praise to the precision of the manner in which they have cooperatively attacked a mighty problem of vital importance to the health and happiness of human beings.

The safety problem as it concerns what might best be taught in respect to preventing loss of life and injury due to high-pressure gas blow-outs while drilling in certain areas is a complex problem requiring considerable detailed analysis. It is analogous to some with which the doctors are faced in that what might appear to be a sole cause for the high-pressure



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gas getting out of control is, in reality, only a contributory cause attended by several others.

Coordinating Drilling Practices With the Potential State of Gases in Certain Subterranean Areas

Ordinarily, high-pressure gases are encountered at sufficient depths which, with the proper mud-conditioning practices, will forestall any tendency on the part of the gases to get out of control. But there are exceptions where ordinary and normal conditions do not exist within the subterranean formations. The shallower levels of the earth's formations possess as many porous substances as do the deeper ones. Thus under proper conditions, the shallower levels of sands are as much of a potential gas conductor as the deeper sands. And such a condition as having the shallower sands charged with an unproportioned high-pressure gas can be brought about in several ways.

Old crater wells a source for unproportionalized high-pressure gas levels: In considering the pressure per square inch of a gas in proportion to the depth at which it is normally encountered under the usual structural conditions, there is a margin of safety for drilling operations which necessitates only the exercise of the usual precaution employed in any high-pressure gas area. But in areas adjacent to old crater wells, there is sufficient reason to believe that there is a possibility that the erupted bore hole has acted as a conductor whereby the normal gas pressure conditions have undergone a radical change from their original state. In other words, since there are no definite means for determining how many formations might have bridged across the erupted bore hole, no means for determining at what depth these bridges might have occurred; therefore, there is no evidence available from an old crater well which could portray a realistic picture of the state of the gases underground. Any efforts at sounding an old crater well with wire lines and other such devices to determine at what level a bridge has formed would be only a useless waste of time. This is because any top bridge, whether or not observed evidence disclosed it to be either a partial or complete seal for escaping gas, could easily be supplemented by several more bridges farther down the bore hole. Any one or all these assumed bridges could act as a deflecting medium which would direct high-pressure gases from the lower formations into the shallower sands.

Concerning the state in which gases may exist at shallower levels in areas adjacent to older crater wells is a matter which operators, who contemplate drilling in such areas, are greatly concerned. In such areas where the potential state of gases create a hazard to drilling operations, from the standpoint of possibly encountering a high-pressure gas without having proceeded sufficiently with the necessary steps of operation to provide the proper precaution, is a safety matter which will be worked out by the safety-minded oil operators. Some of these operators, where they consider the risk a severe one, will consider the feasibility of setting two strings of surface casing.

The precautionary drilling practices of setting longer strings of surface casing than is usual in such questionable areas has its good safety points; yet, there is no reliable information that can be had as to whether or not a high-pressure gas sand will be encountered before surface casing is ready to be set and cemented. Water wells in such questionable areas may offer, through an analysis of their waters, some evidence of gas being present at a shallower depth. But the difficulty is that, as a general rule, the average water well is completed at about half the depth which these long strings of surface casing are bottomed. Thus, from the bottom of the average water well to the depth to which the casing is bottomed, there are many formations which may be good conductors of gas and from which little evidence can be gathered as to what may be the extent of the risk in attempting to drill through them without having installed a reliable blowout preventer.

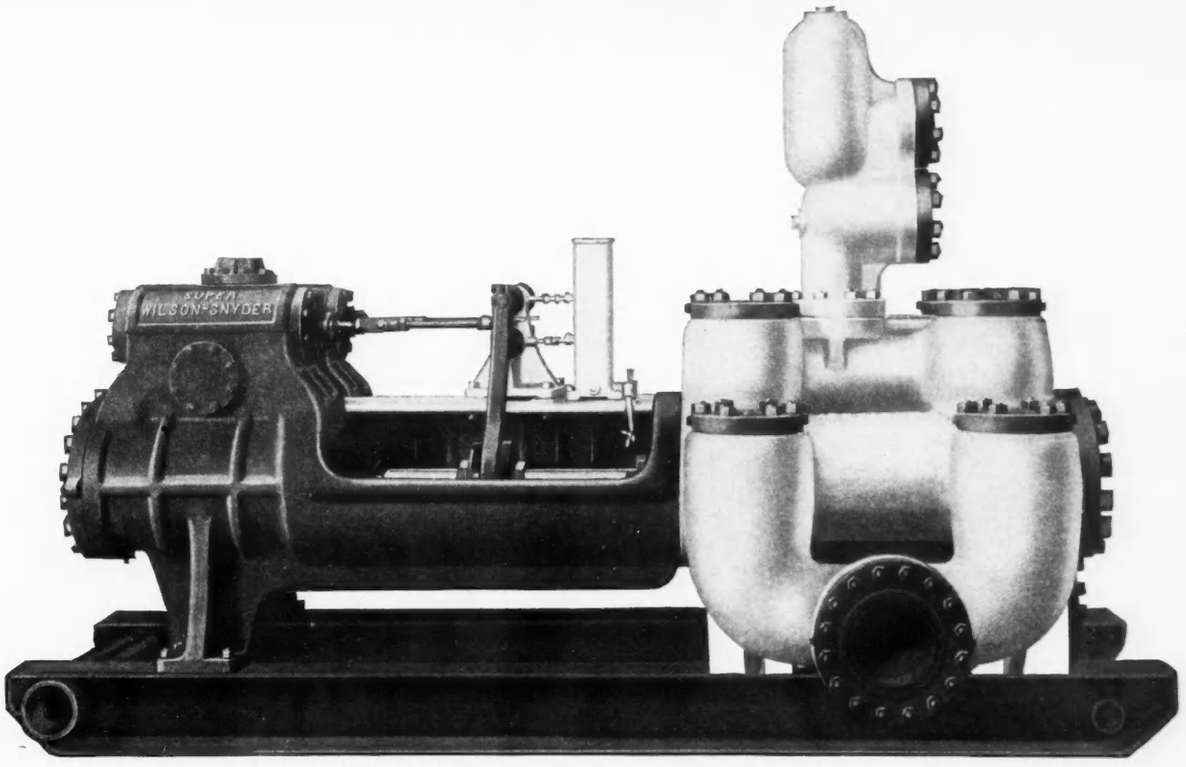
Old abandoned wells may prove to be conductors for gases up to shallower levels: A number of years ago, the extent of concern over what might be the consequences from the manner in which a test well was abandoned was, by comparison with the present day concern, very small. The present day oil operator who drills in adjoining areas to old abandoned wells would be much better off, from a safe operating standpoint, were he able to gather data concerning these old wells. By the term "data" in this sense, it is meant the incidents which occurred, if any, with high-pressure gases and also the processes and practices employed in abandoning such wells. Very often the time spent in ferreting out such pertinent information from those who actually were connected with such old drilling operations can be of utmost value in regulating initial drilling operations on wells to be drilled in the same localities.

The processes and practices employed in abandoning wells some years ago would, no doubt, be considered very irregular in comparison with present day methods. And, too, it very often rests with these old methods as to what may be the state of the high-pressure gases in the adjacent subterranean formations. The gradual disintegration of a cement plug or a cement plug which might have been placed too high in the bore hole, providing gas was encountered, could bring about a subterranean gas condition as equally hazardous as that which is created by an old crater well.

Certain structural conditions surrounding salt domes may create permeable conductors for high-pressure gases to shallower levels: A great many theories have been advanced as to the reason for encountering unusually high-pressure gases in the shallower horizons of the regions on or about salt domes. But rather than be concerned here with which of the theories might be right or wrong, we shall mention two such theories and, thus, hope that from the two combined, a reason for exercising a greater precaution while drilling in such areas will be derived therefrom.

In one particular instance, a well being drilled directly over the peak of a comparatively shallow salt dome encountered a high-pressure gas of sufficient force to demolish a steel drilling derrick and much of the drilling equipment. And through his own quick thinking faculties and his ability to act accordingly, the derrickman narrowly escaped a possible fatal plunge to the earth. From many sources, information leads to the fact that drilling operations were progressing with normal drilling practices on this project. In other words, crews had no idea that a gas of such pressure existed at such a shallow depth.

The point we wish to stress, by the aforementioned example of fact, is that the gas pressure was there and the necessary precautions for such pressures were lacking because such a situation was not anticipated. Had these same men concerned been provided the occasion to study the many theories advancing causes for such conditions, a greater extent of



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precaution would have no doubt been employed.

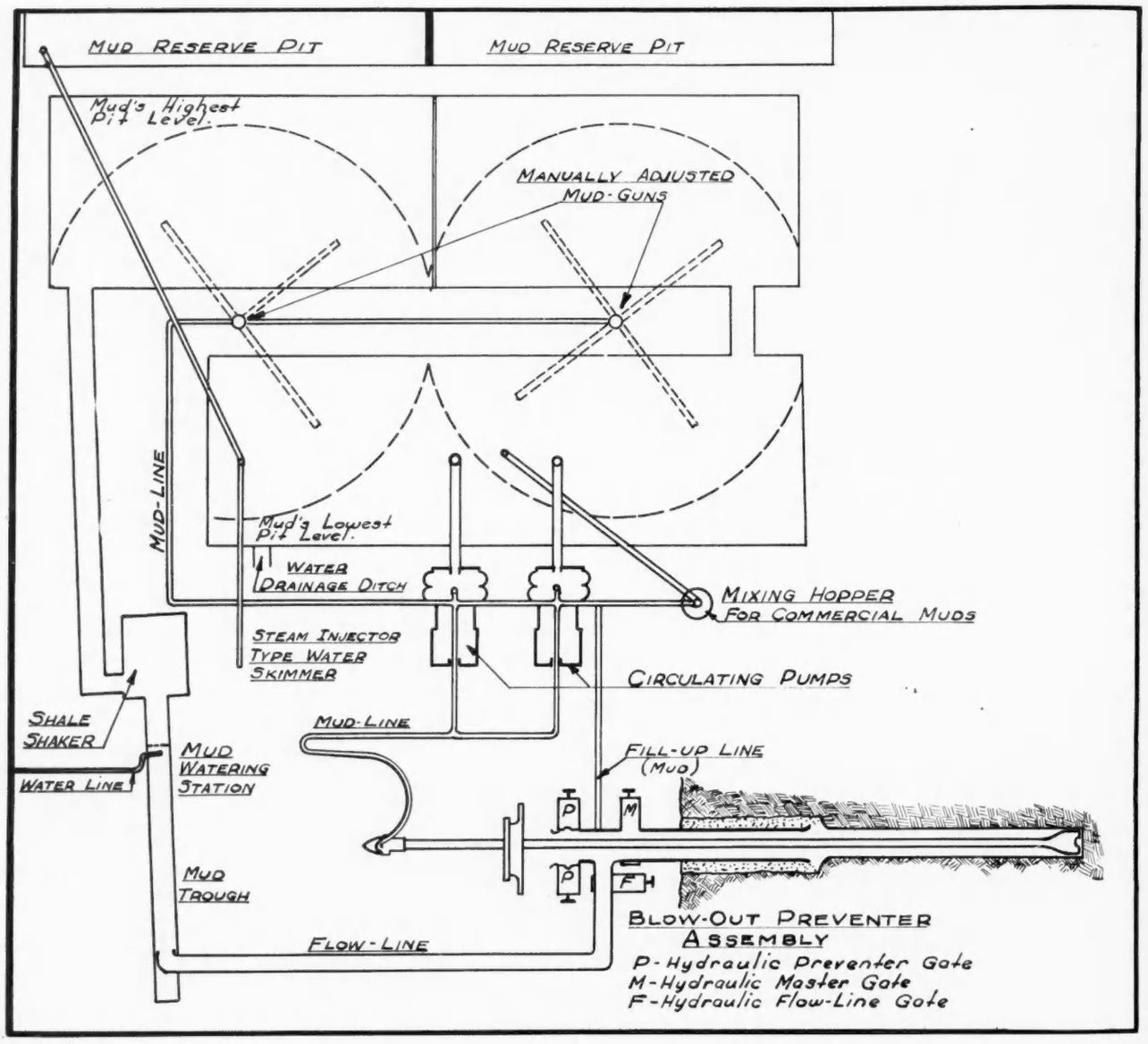
Structural evidence in subterranean regions adjacent to some salt domes points to the belief that these domes force their mass upward through overlying formations. If such should be the case, the gradual upward movement of the salt mass could be instrumental in preventing a complete and safe seal between the impervious shales and the salt mass. Thus, such a condition would create a conductor whereby the normally high-pressure gases from the deeper levels would be led to the shallower sand levels. Another feasible supposition is that as the salt dome gradually rises, it carries along on its peak a compressed mass of gas sand picked up as it thrust its way through such a stratum. As the salt dome continues to rise the sand is further compressed; thus, the gas pressure is more highly intensified.

Practical Manipulations Pertinent to Drilling Mud and Mud-Conditioning Processes

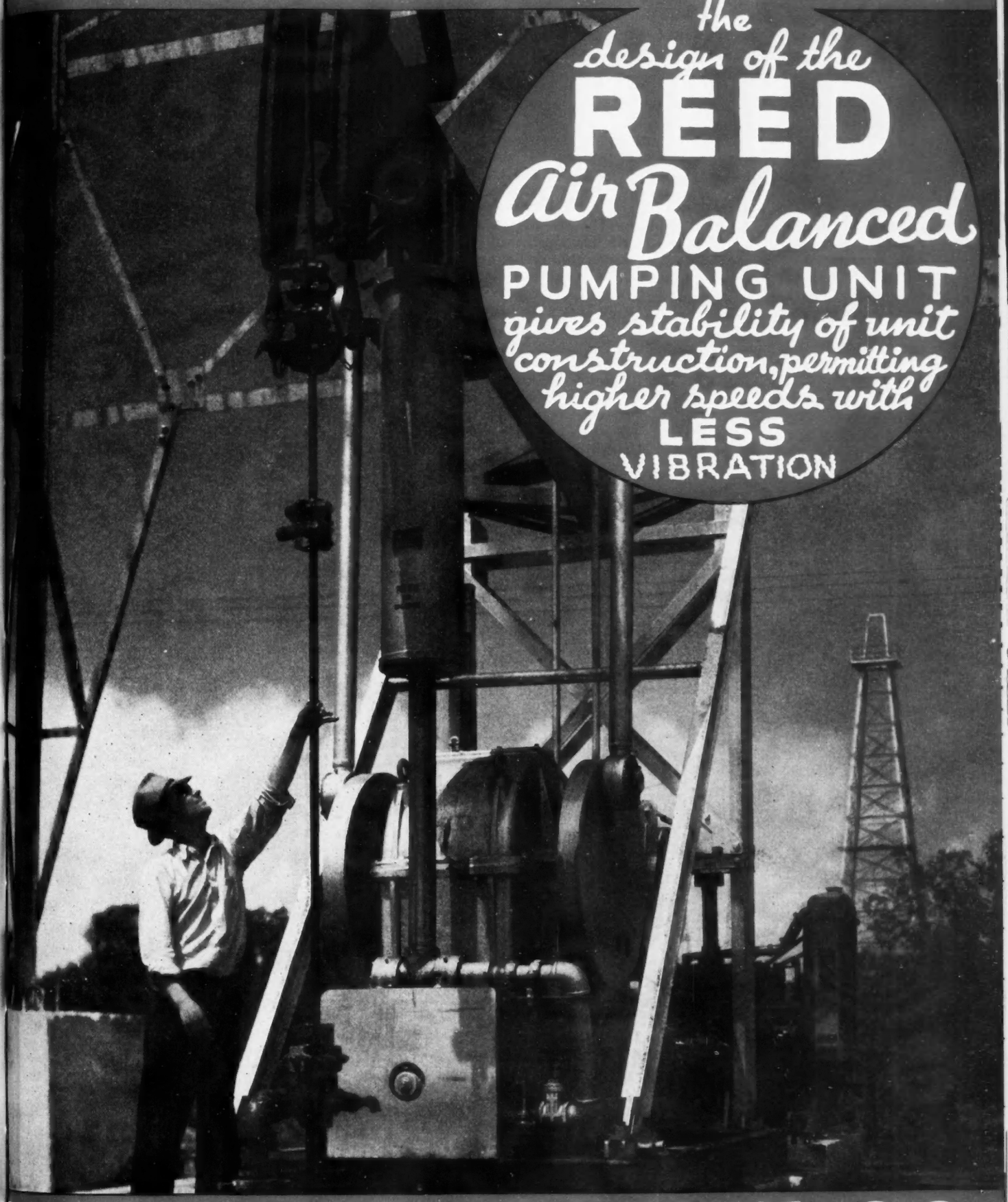
The state of a drilling mud, either while it is employed in actual drilling or while it is standing in a bore hole, is constantly changing in some of its characteristics. Furthermore, certain practices that are executed in connection with various needs pertinent to drilling rig operation, if improperly coordinated with certain relative factors, may also tend to create changes in the state or condition of a drilling-mud. In other words, in order to maintain a condition within a drilling mud which will, from a reasonable standpoint of safety, prevent a high-pressure gas from getting out of control, necessitates many precautionary practices other than testing mud for weight and viscosity characteristics.

Sources from which "light spots" occur in a mud circuit: Let us first establish in mind what is meant by the term "mud circuit." As a matter of convenience and clarity this term has been used to designate the drilling mud itself as well as the journey taken during the course of drilling operations. In other words, as a starting point, the mud, as it enters the suction of the circulating pump, begins the circuit. Hence from there, the mud journeys through various connections, devices, down through the internal space of the drill pipe to the bottom of bore hole and returns to the surface through the annular space between the outer walls

Drilling mud circuit and manipulation points



STABILIZATION



REED ROLLER BIT CO.

of drill pipe and the walls of bore hole. After passing through a number of mud-conditioning devices and processes of manipulation, the mud again returns to the end of pump suction which completes the circuit.

The single column length of a mud circuit varies according to the depth of a bore hole; however, as an example, a well being drilled at a depth of 7920 feet would have a mud circuit totaling slightly over three miles in length. The objective, then, of blow-out prevention measures is to impress upon the minds of those whose duties it is to watch over the condition of a drilling mud—the importance of maintaining the entire mud circuit at an approved and consistent state; that is, any one portion or any two portions of the circuit would, by comparison, be equal in weight and viscosity to any of the other portions.

The uniformity of a mud circuit is disrupted due to the stationary state of the drill-mud while making trips with drill pipe: To completely understand what effect the making of trips with drill pipe may have on the uniformity of a mud-circuit, we must first consider relative factors other than ones directly concerned with the making of the trips.

The first consideration is the time factor; that is, the length of time that is taken to make a trip with a string of drill pipe. For example, to pull and rerun a string of drill pipe 6500 feet in length often requires from the time the bit leaves the bottom until it is returned—something over three hours lapse of time. And during this period of time, the drilling mud in the bore hole is stationary, and at the same time a certain degree of precipitation of the heavier particles or weight elements of the mud takes place. There is also a tendency on the part of many of the deeper shales to absorb much of the water possessed by the mud as it stands in the bore hole. Such action, in turn, increases the viscosity of the mud considerably. With this sort of change in mud characteristics taking place, there is, as a result, a heavy viscous mud in the lower levels of the bore hole, while a lighter mud exists in the upper levels. While this disrupted uniformity in the mud circuit will not decrease the exerted pressure on the bottom of the bore hole; that is, while it is stationary, it will, on the other hand, make a difference when it takes up its circulating position in the mud circuit.

The precaution necessary in a case of this kind is to avoid getting too much thin or light mud into the bore hole where the "light spot" will have to pass a high-pressure gas formation. Take for instance the necessary steps of operation just following the making of a trip. Circulation of the mud circuit is the next thing in order. All the mud in the pits has been stationary during this time, and the lighter properties of the mud are on top of the mud body. To start circulation without any sort of mud manipulation would mean that as the pump picked up the stationary mud to start circulation, the light mud would be the first to come out the flow line. This light mud would, in turn, contact the light mud in the pit, and the light mud in the pit would, in turn, contact the light mud inside the drill pipe. And there a blow-out hazard would exist due to the fact that about a third of a mile of mud circuit would be considerably lighter than the other two thirds.

That period just preceding preparations to start circulation after a trip has been made is a very important period from the standpoint of guarding against a possible blow-out making its initial gesture. A good practice in this regard is to work all the water and lighter properties of the mud into the low end of the mud pit where they might be jetted off into the reserve pit. Mud guns should then be used on the mud to develop as heavy a mud as possible in order that this heavy mud may follow the "light spot" in the drill pipe. Then as the "light spot," which will come first out of the flow line, passes through the pits the action of the mud guns will combine heavier elements of mud with it; thus, with this manner of manipulation, we have reduced the length of the "light spot" by more than half.

To accelerate an equalizing action in the entire mud circuit, water must be added to the heavy viscous spot of the circuit as it passes the watering station. It cannot be considered good safety practice to reduce the heavy spots in a mud circuit too quickly. By saying too quickly, we mean that an attempt should not be made to add enough water at the time the heavy spot first passes the watering station—to reduce it to normal weight and viscosity—but rather by gradually adding water each time the heavy spot passes the circulating action will tend to assist in equalizing the entire mud circuit. It sometimes takes from forty-five minutes to an hour to fully equalize a mud circuit, and it is essential that close attention be given this process of equalizing the mud circuit as it is possible that the beginning of serious gas trouble might ensue as a result of its neglect.

Author's Note: In deeming a spirit of splendid leadership and cooperation the first essential to a fine record in all phases of safety, the author wishes to pay tribute and express appreciation for the privilege of studying safety practices in an organization wherein the priority of safety essentials exist. The Camp Drilling Company conducted by John F. Camp and his drilling superintendent, J. A. (Al) Kilbarn of San Antonio, Texas, has for the past several years operated deep-well drilling equipment in high-pressure gas areas. They also have operated in areas adjacent to old crater wells and in regions adjoining locations of old abandoned wells which gave their operators considerable gas trouble. Through close observance of the detail performances necessary to the control of high-pressure gases, this organization has an enviable record of performance in the handling of high-pressure gases.

(To be continued)

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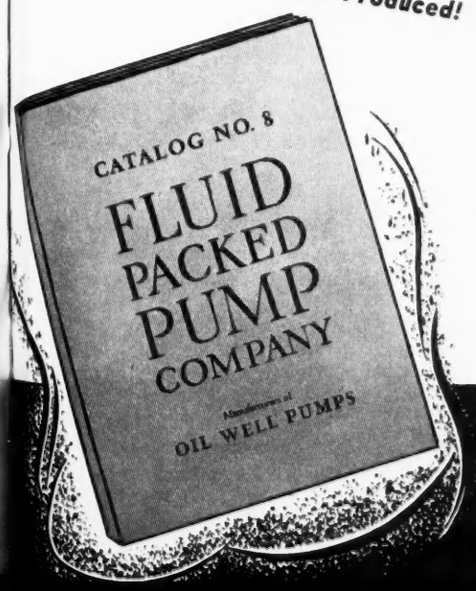

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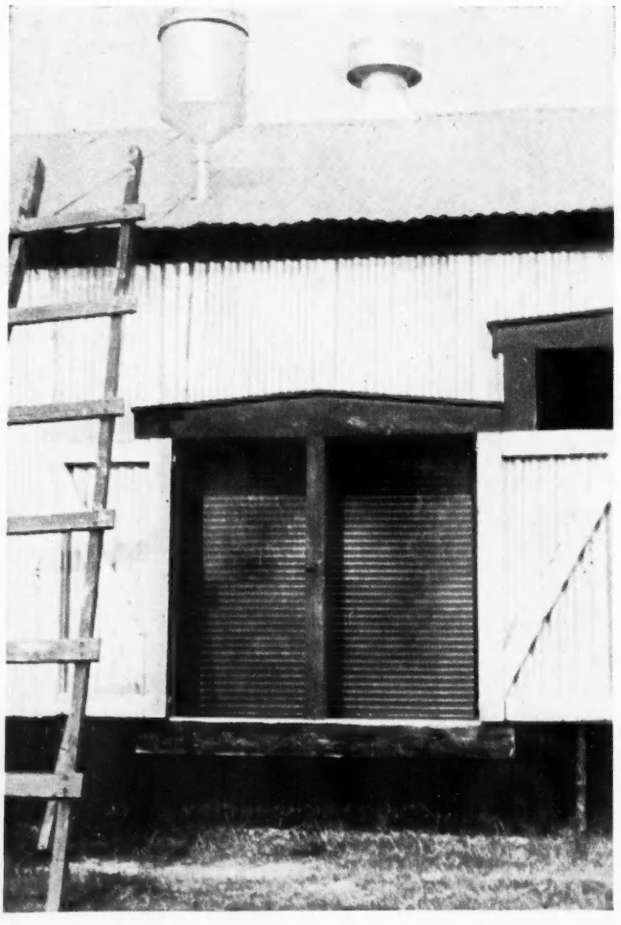
HAPHAZARD handling of the water used as coolant for field pumping engines causes much unnecessary maintenance and replacement work. This is proved by the books of one producer in the East Texas field, which show a reduction in operating outlays since making some slight changes in equipment at the well—this though the machinery involved is older than was the case when the change was first considered.

Its lease located on and near the river, fairly heavily wooded sections, meant that during the fall months flying leaves added much to other air-borne debris—quantities of which seemed to find the shortest route to the wooden tanks used as combination coolers and storage for the water circulated through the gas engines driving the well pumping units. This wind-carried trash quickly became water-logged, sinking to clog the inlet foot-valve and/or strainer, with resultant shutting off or serious diminution of the water reaching the water jacket of the engine. Seized pistons, scored cylinders and other engine breakdowns resulted, causing maintenance expense and lost production time.

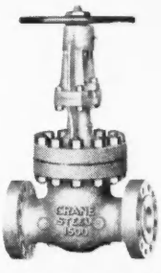
Following a number of such mechanical failures each traceable to trash within the tanks, the company fabricated a light welded steel frame, over which is stretched a mesh made of ordinary chicken-wire fencing with half-inch openings. This screen is sufficient to stop much of the air-transported trash, and requires only infrequent sweeping to remove the collected debris and permit air circulation over the water surface.

In the Talco field one operator is adopting this screening plan, but using instead of the light chicken-



Only the outdoor expansion tank must face the weather in this enclosed system, and doors open in summer close to provide winter warmth and promote better engine operation.

Crane Steel Valves for "Dump Valve" Duty



Hot oil handling calls for "hard boiled" valves. Take "dump valve" duty on furnace lines—there's a service that is really tough. Crane makes the No. 87 X for just such spots. In refineries everywhere, you can see these sturdy 1500 pound cast steel gates demonstrating their ability to bear the stresses and strains of pressures over 850 pounds, at temperatures above 1000° F.

Firmly resisting the corrosion encountered in such service, these Crane No. 87 X's hold tight against loss of oil. And yet, when danger threatens, at a moment's notice they'll open wide.

It pays in the long run to be sure of unfailing service in valves—and the sure way to enjoy extra safety and extra value in valves is to Crane-Equip throughout.

VALVES MUST BE GOOD

TO STAND OIL REFINERY SERVICE

Constantly on guard—protecting valuable equipment—preventing any interruption of service, Crane valves on this exhaust steam header were selected because of their reliability—that quality of plus satisfaction that is so much a part of every Crane installation.

Probably in no other field do valves meet tougher service than in oil refineries—they have to be tough to deliver under these conditions. But tough valves can't be built without paying attention to every little detail. The design must be right, the metals must be right, too. Seats, discs and flange faces must be finished with extreme accuracy and it's because Crane valves are built with such extra care that service records show that Crane valves "deliver" even under the extremes in pressure and temperature met in refinery service.

In the Crane line are valves and fittings in brass, iron and forged steel and in alloys—body and trim combinations for any service—welded fittings and fabricated piping to fit your needs at all working pressures and temperatures — 38,000 items. Put your refinery on a straight Crane basis—it's the simple economical way to handle your valve, fitting and piping problems.

CRANE

CRANE CO. GENERAL OFFICES
836 S. MICHIGAN AVE., CHICAGO

VALVES • FITTINGS • PIPE
PLUMBING • HEATING • PUMPS

NATION-WIDE SERVICE THROUGH BRANCHES AND WHOLESALERS IN ALL MARKETS

wire a galvanized metal lath, obtainable in eight-foot by two-foot sections, which are tack welded to the sucker-rod spider spanning the tank top and which are heavy enough to prevent unauthorized use of the tanks as swimming pools, as well as stopping all but the finer particles of trash carried by the wind.

By the use of this expanded metal lath, carried right under the spray head on the cooling water return, more extensive diffusion of the heated water is secured, and the water returned to the larger body in the tank at a temperature much lower than is the case where the return is simply permitted to flow back, with perhaps a two-foot fall through free air.

That the lease cooling tank is sometimes a hazard is little realized by many operators. Yet nothing is more tempting to the average small boy than one of the wooden tanks, up which the bands seem to provide a most inviting means of access to the water within. Unfortunately for the youthful adventurers, there is no such easy way out of the water, and if the level happens to be below arm's reach of the top, tragedy is apt to intervene. At least two disappearances of sons from oil field families have been solved recently by the finding of skeletons or almost unidentifiable bodies within two such tanks—in which the water level prevented a handhold on the stave top.

To guard against such tragedy one lease is provided with guarded tanks whereon a bracket system and barbed wire strands emphatically cancel the invitation the hoop seems to extend.

Although the first cost of an enclosed system is higher than the outdoor tank, it offers many advantages which in these days of prorated production and longer-lived fields deserve consideration. Such a system permits the use of treated water, reducing corrosion in the power unit to a minimum and through carrying a relatively small amount of water, may be economically treated with anti-freeze for winter operation.

One such system of enclosed or radiator-type of cooling sets the radiator just behind a wide opening in the pump house wall, with twin doors which may be thrown wide, or closed to any desired position. When thrown wide, practically all the heated air blown through the coils is discharged outside the building. At the other extreme, with the doors tightly closed, the hot air is forced outward through the narrow space between doors and radiator, to find its way back around the pump house and maintain an equable operating temperature during the Winter.

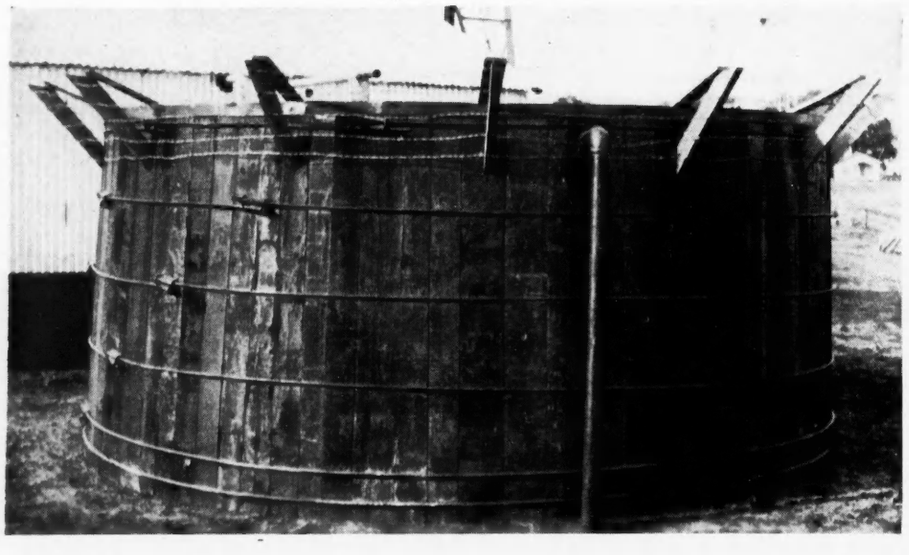
Such a closed system is foolproof if set so closely to the pump house wall as to prevent entry between coils and building of windborne trash, and is safe—offering no hazardous swimming "hole" as do the tanks, unless shielded or covered with heavy mesh.

That the very aeration of water relied upon to aid in cooling it greatly speeds up rusting and corrosion was again proved by the experience of one company which installed two similar pumping units, returning the cooling water to the tank on one through the usual spray head, while the other had a closed system with radiators or fin-equipped tube units atop the pump house and a closed tank for stock.

On these two units, each filled with water from a common supply, periodic shake-outs were run on the water, to determine what pollution, if any, was present. These samples, taken from a branch in the hot water return just above the engine cylinder outlet in each case, started off with practically identical readings when centrifuged at a standard speed of 1500 revolutions per minute for 10 minutes.

Within the first month after the units were put in service, however, the open tank system began to check up with rust particles plainly visible in the bottom of the tube after whirling, while the closed system remained clear. After six months, the water in the exposed system was carrying more than ten times the impurities discernible in the other samples—indisputable evidence that rusting of pipe and engine surfaces was being accelerated by the air trapped at the overflow and carried into the unit to complete the condition of water, air, impurity and iron which must be present for rusting to occur.

So conclusive were this company's tests that all new units being installed by it are equipped to exclude air from the cooling system—and thus to exclude a major portion of the maintenance and repair bills formerly cutting into production profits.



"Crowned" with barbed wire on protruding brackets, this cooling water tank does not invite use as substitute for the "old swimmin' hole."

Congratulations THE TEXAS COMPANY

ON YOUR CASING RECORD AT STATE HORSESHOE BAYOU NO. 2

11,632 feet of 9⅝" casing set and cemented—a feat that required the utmost in technique and a record that demanded the best from men and materials. Setting casing with a total weight of 250 tons (equal to the combined tractive efforts of eight heavy passenger locomotives) at a point two and one-fifth miles below ground is a task which all operators will appreciate.

We are very pleased that The Texas Company selected Baroid Products for use in the drilling of this well, and at the time this casing was run.

Casing Size: 9⅝"
Casing Weight: 43.50 lbs. per foot
Total Length: 11,632 feet
Total Weight of Casing: 505,296 lbs.
Started Running Casing: 6:30 p. m. Nov. 9
On Bottom: 2:55 p. m. Nov. 10
Total Time Running and Cementing Casing: 23 hours, 21 minutes
Floated: Last 3,000 feet
Maximum Weight on Indicator: 280,000 lbs.
Mud Data: At Time Casing Was Run:
Type: Baroid-Aquagel
Weight: 11.1 lbs. per gallon (83.0 lbs. per cubic foot)
Viscosity (Stormer Instruments at 600 r. p. m.): 23 centipoises
Viscosity (Marsh Funnel—1500 cc. in; 1000 cc. out): 51 seconds
Water Loss (Baroid Low Pressure Tester): 16 cc. in 30 minutes
Cake Thickness: 4-32 of an inch

BAROID PRODUCTS

BAROID—Extra-Heavy Drilling Mud. • AQUAGEL—Trouble-Proof Colloidal Drilling Mud. • STABILITE—An Improved Chemical Mud Thinner. • BAROCO—An Economical, Salt Water Resisting Drilling Clay. • FIBROTEX—For Preventing or Regaining Lost Circulation. • AQUAGEL for CEMENT—For setting casing and restoring lost circulation. • TESTING EQUIPMENT—For drilling mud analysis and control.

Stocks carried and service engineers available in all active oil fields. Look for this trade mark under "Oil Well Drilling Mud" in your classified telephone directions for our nearest service engineer and distributor.

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BAROID SALES DEPARTMENT

NATIONAL PIGMENTS & CHEMICAL DIVISION OF
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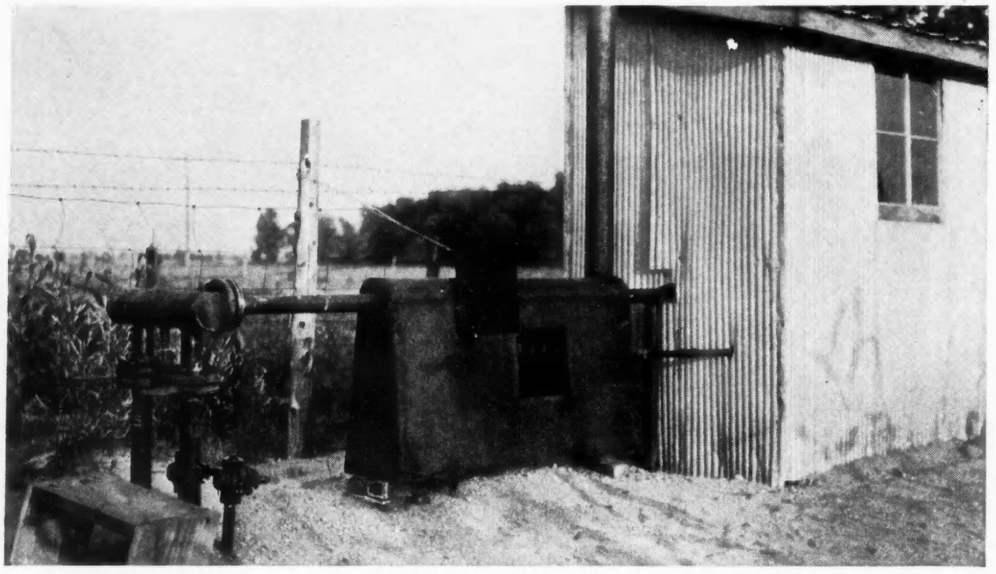
BAROID SALES OFFICES • LOS ANGELES • TULSA • HOUSTON



Gas-fired heater used on oil transmission line south of Mount Pleasant, Michigan, to prevent congealing of oil.

MOVING OIL THROUGH LINES IN FREEZING WEATHER BY USE OF A GAS-FIRED

Pipe Line Heater

By JOHN ALBRIGHT

WINTER temperatures in Michigan are quite low for months at a time. In some instances oil in lines becomes so sluggish with cold it cannot be pumped without heating.

Fuel Problem Simple

A practical means of meeting the problem has been put into effect on a crude oil line from Crystal field to Mount Pleasant. Fortunately, the crude line is paralleled by a gas line, rendering the problem of fuel requirement for the heater relatively simple.

The heater dealt with in this sketch is located near a state highway, making it easily accessible for maintenance and service. It is spotted at a point where the oil line crosses a property line, thus interfering very little with plowing, planting and harvesting activities of the property owner.

Only a portion of the oil flowing through the 4-inch carrier is warmed by the heater. The carrier stream is split by placing a manifold above the line, using 2-inch pipe for the purpose. The 2-inch line splitting the carrier stream rises from the main line, carrying part of the oil through the heating element and passing through a building containing an orifice meter used to measure the gas utilized for heating.

The Burner

The heater pictured herewith is built of heavy sheet metal to provide stability and to prevent damage to the burners by heavy snowdrifts.

Supported by the 2-inch pipe loop, the lease-fabricated heater shield is welded throughout. Burners within the shield are made up of ¾-inch street tees, 8 coupled together in line with the side outlets looking up. Short nipples screwed into these outlets are slotted to provide sufficient air to support satisfactory combustion.

Flame Height Constant

The gas line furnishing fuel for the burner is connected to one end of the burner assembly, which is equipped with a gate valve for gas volume control. The tips of the burners being a safe distance below the oil-carrying line, use of a thermostat to control the flame is not necessary, and the flame height remains constant without damage to the metal of the oil line.

Combustion gases escape through a stack fitted at one end of the shield. Burners are inspected or lighted through a door fastened to the side of the unit with a stove bolt.

WORLD DEVELOPMENT and TECHNOLOGY

Edited by
WM. V. GROSS, Associate Editor

Canadian Fields

Board cuts Turner Valley allowable 20 percent.
Directional surveys must be made every 500 feet.
Naphtha gas production to be drastically curtailed.

The Alberta Petroleum & Natural Gas Conservation Board last week ordered a 20 percent reduction in the allowable production of the Turner Valley field, lowering daily production from 12,500 barrels to 10,000 barrels.

While the reduction for each well will vary because of the board's method of determining allowables based on gas/oil ratio and other factors, the average drop will be more than 20 percent because of wells completed since the last order was issued December 5, 1938. The new allowable is distributed among 68 crude producers.

Gas Waste Reduced

In the same order, the board clamped down on gas waste in Turner Valley by cutting daily production from 108,000,000 cubic feet to 65,000,000 cubic feet daily. It is the first reduction in gas naphtha wells in the older section of the field to a figure approximating market demand for gas since discovery of crude in the southwest flank 2½ years ago. Until recently, gas wells had been running wide open, producing about 200,000,000 cubic feet a day in the production of about 2000 barrels of naphtha.

The board, in its order last week, left the way open for construction of a repressuring plant by declaring that gas production in excess of the allowed 1,951,599,000 cubic feet a month "shall be replaced with the minimum amount of loss into the earth at such place or places, in such horizon or horizons and in such manner as may be, from time to time, approved by the board."

Wells Classified

Wells at which the rate of production of oil in liquid form, produced and recovered at the well head, does not exceed 35 gallons of oil for 31,000 cubic feet of gas are defined as gas wells, while wells using less gas in production of 35 gallons of oil are classified as crude wells. Gas wells in Turner Valley number 105.

Royal Canadian Oils, Ltd.'s 2, with an allowable reduction from 445 to 302 barrels, continues as the field's largest well. Of greater importance is the 276-barrel allowable given Home Oil Company, Ltd.'s Millarville 2, recently completed 12 miles north of the southwest flank producing area and opening a large new area for development. The Home well, ranking third in the field, is also surpassed by Vulcan-Brown Petroleums, Ltd.'s 1 at 283 barrels.

Board Given Control

An order-in-council approved by the Alberta government recently vested enforcement of strict regulations governing drilling and production of all oil and gas wells in the Canadian province in the Petroleum & Natural Gas Conservation Board. Violation of regulations is punishable by cancellation or suspension of licenses, or by sealing in producing wells.

Elimination of crooked holes which experts say abound in Turner Valley is one objective of the new regulations, said W. F. Knode, board chairman. Directional tests have been ordered with every 500 feet of drilling, and in the event a well deviates more than 4 degrees on a 40-acre site, or more than 3 degrees in the case of a well drilled on a smaller tract, corrective measures may be prescribed by the board. If a well is found to have "wandered" more than half the distance from the top of the well to the nearest boundary, drilling must be stopped and the well kept from production.

Chokes and Meters

Other regulations provide that all crude wells be equipped with chokes and gas wells with meters for an accurate check on production, copies of daily records on production be submitted to the board once a month to check compliance with proration schedules, all waste or refuse be drained a safe distance from the well and burned or hauled away, that smoking be prohibited within 75 feet of any drilling or producing well, or within 100 feet of storage tanks, that fire guards in the nature of large dikes or ditches be provided around storage tanks and that no boilers or electrical generators be permitted within 150 feet of a producing well or oil tanks, that core samples of various formations drilled through be taken every 10 feet, "washed and dried, accurately tabulated and forwarded to the board," that when water, petroleum or natural gas is encountered, samples be taken and submitted for analysis, that core samples taken be protected "under lock and key" from theft and misplacement until sent to the board, that notices of plans to deepen, repair, redrill, perforate or alter casing at any producing well, or at a well where drilling has been halted for 3 months, be given the board 15 days before operations are started, and that approval be obtained from the board before a well is shot, acidized or perforated.

The only gas burned in the field will be in the crude area, where gas used to lift crude to the surface will be burned until a repressuring plan is put into effect. Knode indicated that the board was anxious to see a repressuring plan adopted as a further means of prolonging the life of the field.

Royal commission studies Alberta pipe line rates

Estimates of 8½ and 20 percent as a proper return on Royalite Oil Company, Limited's pipe line system linking the Turner Valley field of Alberta, Canada, to Calgary were given recently by opposing witnesses before a Royal Commission investigating the province's oil industry. The commission did not complete the pipe line phase of its inquiry, which has been occupying it since late last year, as expected, but an end was in sight this week.

Commissioners Justice A. A. McGillivray and Major L. R. Lipsett indicated that a recess of approximately a week would be taken soon to study evidence on pipe line rates submitted during the past two months. The commission will recommend to the Alberta utilities board whether the present charge of 15 cents a barrel for transporting crude from the field to Calgary should be allowed to stand, or should be lowered.

When it resumes, the commission will investigate crude oil prices and refining costs in the province, and their

relation to retail costs of finished products made from Alberta crude and finished products shipped in from the United States.

During the past week's testimony, the commission was told that Royalite will further expand its pipe line system during the year at a cost of $260,000, representing an increase of $52,000 in its budget for additions. J. W. Taylor, Toronto auditor, declared the expenditure will be made entirely for new feeder lines to Turner Valley wells, and that it was unlikely that trunk lines would be added.

Says 8½ Percent Fair

Kenneth Morrison, accountant retained by J. J. Frawley, K. C., commission counsel, declared that a return of 8½ percent should be allowed the Royalite Company for its investment in its pipe line system. He based his figure on a similar return allowed the Canadian Western Natural Gas, Light, Heat & Power Company in 1931 by the provincial utilities board, declaring that hazards of operating the gas company's system could be considered similar to the hazards faced by the Royalite Company in respect to return on investment.

Taylor told the commission the company should be allowed a 20 percent return on its investment, qualifying his figure by citing the hazards involved in the operation of a pipe line system.

The Toronto auditor, who was a witness of the Royalite Company, declared that the company had realized a net profit in its pipe line division of $1,149,222 during the 7 years and 9 months ended September 30, 1938. This was slightly over 100 percent of the company's investment in the pipe line system, set by Taylor as being $1,148,378 as of the same date.

During the period, the company invested $834,000 of its net profit in net additions to capital assets, leaving a balance of net profit, not re-invested, of $315,221 or 24 percent for the short 8-year period.

"The putting back into the business of a substantial portion of the annual earnings is part of the past history of every successful company," Taylor said. "While it is true that the investor's equity is enhanced through this policy, it should be borne in mind that, in this particular case, the amount retained in the business has been invested in fixed assets and so has become frozen as capital in a business which is highly speculative."

Division of Costs

The average cost of gathering and transporting a barrel of crude during the 7 years and 9 months was 11.11 cents, comprised of 8.65 cents transportation charges and 2.46 cents for federal and provincial income taxes. During the same period, the company realized a net profit of 9.65 cents on every barrel of oil gathered and transported. The gross income averaged 19.58 cents a barrel, compared to the present pipe line rate of 15 cents.

Taylor told the commission the present transportation rate was reasonable, and that profits realized by the company in early years should not be taken into consideration in deciding the present rate. Depreciation should be allowed, he said, on the value of the system over a 10-year period from the end of 1936, the year in which crude oil was discovered in large quantity in Turner Valley.

Arthur Maw, Royalite auditor, discussing the company's investment in its pipe line system, declared that the commission should take into consideration an investment of $178,885 in a six-inch loop to its pipe line laid in 1929, and taken up again in 1932, when recommending a pipe line rate. While the laying of the line may have been a mistake and although the asset no longer existed, the investment should be taken into consideration and be figured in determining on what figure the company is entitled a return.

That the commission may not be inclined to include the item in determining the company's investment was indicated when Justice McGillivray asked if the company had pulled up two of its present three pipe lines between Turner Valley and Calgary, whether a pipe line rate should be based on the capital invested in the two pipe lines pulled up as well as on the existing line. The chairman added that the commission was concerned with the amount the people should pay for oil transportation as well as with the question of whether or not Royalite shareholders would receive a fair return on their investment.

May Make Line Utility

Indication that the commission was considering recommending that the Royalite Company's pipe line system be declared a public utility and placed under strict government supervision came at two points during last week's hearings. To a question put by Frawley, Taylor admitted that "for practical purposes" the system is a public utility. The witness added that if the system was to be treated as a public utility, hazards encountered in the oil industry must be taken into account. In addition to dry holes and shallower fields, he mentioned poor crops which would bring a drop in sales of oil and oil products.

U. S. Congress votes "hands off" in Mexican controversy

Refusing to interfere with the efforts of the State Department to negotiate an amicable settlement of the controversy over Mexico's expropriation of American oil and other properties, the House of Representatives last week tabled a resolution offered by Congressman Martin J. Kennedy (Dem., N.Y.), calling upon the Secretary of State to furnish information regarding the situation.

Action of the House was in line with a report submitted February 7 by Representative Bloom (Dem., N.Y.) for the Foreign Relations Committee, disclosing that such information available to the department "as is consistent with the public interest" had been furnished the committee.

The Kennedy resolution called for the submission of information not only regarding the oil situation but also regarding reports of intimate relations between Mexico and Germany and Japan, among the questions specifically raised being the following:

"Is it true that the Mexican government bartered oil from American and British properties expropriated for German, Italian and Japanese products, and is increasing such barter arrangements?

"Exclusive of oil, have not American investments in Mexico been eliminated, or decreased enormously in value, since 1929, and has not this process been vastly accelerated since President Cardenas took office?

"Have reported losses of American investments in many fields led to reductions in United States-Mexican trade?

"Does the State Department have any evidence that Germany, Italy and Japan had an agreement to absorb Mexican oil, including that now being shipped to the German and Italian navies, before expropriation of American and British properties? Did not such shipments start almost immediately after expropriation?

"Did the ambassador inform the State Department beforehand that the railroads and oil properties would be expropriated or was that as Mr. Josephus Daniels was publicly quoted as saying later 'a bolt from the blue'?

"Has the State Department a full record of the American ambassador's speeches and public remarks in the period prior to any after the recent maior expropriations and does it endorse these?

"What was the complete text of all speeches made by the American ambassador to Mexico on the subject of expropriation and also the complete text of all his reports to the Secretary of State on this subject, and on the subject of Mexico's relations with Germany, Italy and Japan, as well as reports from other sources on the same subjects?

"Is it satisfied that the American ambassador in Mexico City is now taking steps to protect the remaining American investments in Mexico on a fair basis?

"Did the State Department, as publicly reported, agree to the expropriation of any American-owned property in Mexico after the recent United States-Mexican agreement to adjudicate land claims was signed, and was any such property expropriated?"

The oil situation is understood to have been brought to the attention of President Roosevelt last week during a visit to the White House by the Mexican ambassador, Dr. Francisco Castillo Najera.

Colon completes well

Colon Development Company, Limited, reports that after repairing, T-52 at Tarra field (Las Cruces) Venezuela was brought in flowing at the rate of 420 barrels per day.

CAPTAIN T. RIEBER, chairman of the board of The Texas Company, headed a group of South American Gulf Oil Company officials on a recent trip to the Barco concession in Colombia. Others in the group from The Texas Company, joint owner with Socony-Vacuum Oil Company of the above mentioned company, were W. S. S. Rogers, president, and R. Ogarrio and H. T. Klein, vice presidents. Those representing Socony-Vacuum on the trip were John A. Brown, president, Arthur F. Corwin, George V. Holton and Harold F. Sheets, vice presidents.

MEN IN THE INDUSTRY'S NEWS

MERLE REDBURN, scout in Kansas for Ohio Oil Company for 10 years, has been transferred to the Louisiana coastal area and will make his headquarters at Lafayette. He has been succeeded at Wichita by I. S. Layton, formerly at Great Bend.

HAL E. REDMON, formerly in charge of land and geological operations for National Refining Company, has been promoted to superintendent of exploration for the company in the entire area west of the Mississippi. He will have charge of land and lease, geological, geophysical, scouting and consulting production engineering departments, maintaining his headquarters at Wichita. O. G. Gosnell, former western Kansas production superintendent for the company at Russell, has been named superintendent of production in Kansas and has transferred to Wichita.

H. M. HORTON, director and chief geologist for Superior Oil Company, Houston, is resigning from the company, effective February 15, and will open an office in Houston, specializing in geological, geophysical and land work on the Texas and Louisiana Gulf Coast, Illinois-Indiana Basin and California territories. Horton is a graduate of University of California, obtaining his A. B. degree in geology in 1924. He started with Standard Oil Company of California in 1924 as geologist in the San Joaquin Valley, at various times being stationed at Bakersfield, Taft, Wasco and Coalinga. He left that company in 1929 to go with Superior Oil Company of California and worked in California until 1931, when he was transferred to Dallas as district geologist for the Mid-Continent region. Moved to Houston in 1932, he was appointed chief geologist in 1934, and was elected to the board of directors in 1937.

H. M. HORTON

JOHN F. O'DONOHOE, Wichita Falls, head of Petroleum Producers Company, was elected president of the North Texas Oil & Gas Association at the annual directors' meeting held February 7 in Wichita Falls. He succeeds Peyton F. Gwynn, Wichita Falls producer.

O'Donohoe has been identified with the oil business about 35 years. He is a native of Pascagoula, Mississippi, and was educated at New Orleans. At the age of 19 he was employed by Evangeline Oil Company at Lafayette, Louisiana, then in 1909 became a scout for J. M. Guffey Petroleum Company in South Louisiana, with headquarters at New Orleans. He was transferred to North Texas to scout the Petrolia and Electra fields for the company. In 1912, he resigned to work for The Texas Company. Four years later he became manager of Wichita Falls Fuel & Development Company. The latter disposed of its holdings, and O'Donohoe elected to turn independent. He organized United Producers Company in 1919. The company was successful in developing production, and the controlling interest was sold a year later. Petroleum Producers Company, which now has extensive properties in North and West Central Texas, was formed by O'Donohoe as a partnership venture in March, 1921. He became president when the company was incorporated January 1, 1927.

J. H. S. Bonner and John W. Thomas were elected vice presidents, and Dave Gray was retained as executive vice president.

WILBUR HARRISON, vice president of Apex Petroleum Company and chairman of the Signal Hill curtailment committee, has been elected president of the California Stripper Well Association. Other officers elected included Richard Fenton, executive vice president; Neal Elder and A. D. Mitchell, vice presidents, and Robert I. Plomer, petroleum engineer for McCrate interests of Long Beach, secretary-treasurer.

WILLIAM K. COTTRELL, former auditor and examiner of the Oklahoma Tax Commission, has been elected secretary-treasurer of East Texas Refining Company, Dallas. He had served the Oklahoma commission since 1934, having previously been secretary-treasurer of Oklahoma Natural Gas Company.

N. E. HARDIE, superintendent of production in the East Texas field for Cook Drilling Company, has been placed in charge of field operations of Hubbell Production Company, which recently purchased 12 pumpers in the Joiner area. Hardie will continue to reside at Overton.

G. E. EVERETT, who has been public relations director of Western Petroleum Refiners Association, has been appointed assistant director of Public Relations of the American Petroleum Institute. Everett came to Tulsa headquarters of the refiners' organization two years ago after a year in charge of publicity for its program of promotion of the use of oil in highway construction.

H. C. ARNOLD has been elected a vice president of the British-American Oil Producing Company, Tulsa. He will continue to direct both land and geological departments.

R. B. CURRAN, chief scout for Carter Oil Company, Tulsa, has been assigned temporarily to the marketing department. He will assist in coordination of crude oil sales and purchases occasioned by expansion of field operations. Charles D. Wells, who has headquarters in Wichita, Kansas, has been transferred to Tulsa to act as chief scout.

LAWRENCE C. (PAT) KEELEY, for the past 17 years geologist and paleontologist with Mexican Gulf Oil Company in Mexico, has resigned and returned to the United States. He intends to make his home in Wisconsin.

GEORGE BUCHANAN, vice president of Adams Oil & Gas Company, and F. W. Freeburn, general superintendent, made a routine inspection tour of the company's Illinois properties last week. Jake Haas, Centralia, is in charge of the company's Illinois basin operations.

FRED W. BATES has resigned as geologist for Continental Oil Company at Lafayette, Louisiana, to engage in consulting geologic and micropaleontologic work in the Gulf Coast of Louisiana. He has had wide experience in the development of the Sparta-Wilcox trend, and was geologist for S. W. Richardson and associated interests on their discovery well at Eola, Avoyelles Parish. He was associated with Amerada Petroleum Corporation in drilling the discovery well at Cheneyville, Rapides Parish, and was geologist and paleontologist for Continental Oil Company during drilling of the discovery and subsequent wells at Ville Platte.

Bates holds the degree of Bachelor of

FRED W. BATES

Science in mining engineering from Princeton University, and has done graduate and research work in petroleum geology and micropaleontology at the University of Oklahoma.

He is being retained by S. W. Richardson and associates in the development of the Eola field, and will maintain offices at Lafayette, Louisiana.

JERRY GANN, of Red Bank Oil Company, Houston, is down to earth again after the arrival of a new daughter, February 5. Mrs. Gann and daughter, Patricia, are doing fine.

W. H. MASSEY, Stanolind Oil & Gas Company, discussed "Oil Company Accounting With Particular Reference to the Purchasing Agent" before the Purchasing Agents Association of Tulsa last week. J. S. Hawley was chairman of the program committee for the meeting.

JIM "SONNY" NOEL, scout in Kansas for Atlantic Refining Company, has been transferred to Houston.

A. L. ELLSWORTH, president, and J. C. Miller, vice president, both of Toronto, Canada, headed a party of British-American Oil Company officials on a tour of the Mid-Continent fields which was completed last week. While in Tulsa, they conferred with W. K. Whiteford, vice president in charge of operations in the United States; H. C. Arnold, head of the land and geological department, and Warren Beebe, Kansas district geologist, and other Mid-Continent representatives of the company.

L. L. PALMER, Kansas district geologist for W. C. McBride, Inc., at Wichita, has been transferred to San Antonio, Texas.

LAWRENCE MILLER, gauger for National Transit Company, retired last week after 55 years continuous service with the Pennsylvania company. With his wife, he plans to move from Franklin, Pennsylvania, to Canton, Ohio, where he will make his home with his son.

HENRY M. GOODEN, Tulsa, was in Evansville last week while looking over oil activity in Indiana, Kentucky and Illinois.

L. B. SIMMONS, Dr. H. B. Alspaugh and L. E. Kincannon, all interested in the Rock Island Refining Company, last week organized Rocket Oil Company, of Duncan, as an Oklahoma corporation to take over southern Oklahoma producing properties being purchased from Carter Oil Company.

DIED:

SIR HENRI DETERDING, 72, frequently styled "The Napoleon of Oil" died on February 4 at his estate in Dobbin, Mecklenburg, Germany.

Born in Amsterdam, Holland, in 1866, the son of a sea captain, young Henri was expected to follow his father's calling, but after the father's death his widow was unable to provide the funds for a maritime education, and a short course in banking and apprenticeship in an Amsterdam bank was the only course open. Deterding despaired at the slow promotion and in 1888 went to the East Indies as a clerk for the Netherlands Trading Society. A year later he accepted a position with the then small Royal Dutch Petroleum Company and rose in the organization until at the death of its first president, J. B. A. Kessler, he was in virtual control. In 1890 when he organized East Indian producers on a cooperative basis and was able thereby to challenge Rockefeller's supremacy in the price-cutting wars that ensued between the Standard Oil Company and Royal Dutch Petroleum, and even to carry the fight to Rockefeller by an invasion of this country. In 1897 the conversion of British naval vessels from coal to oil-burners presented an opportunity to ally Royal Dutch with the newly formed Shell Transport and Trading Company, which was financed by the Paris Rothschilds. Deterding gained his title in rec-

SIR HENRI DETERDING

ognition of war services of signal value to the British government. For several years following the war he devoted much time and millions of dollars to an attempt to regain Russian concessions revoked by the Soviet government, and in 1927 precipitated one of the most bitter wars in the history of the industry by cutting prices in every market in which Russian oil appeared.

Deterding remained in active control of his oil empire until 1937, and thereafter devoted himself to philanthropic and educational projects. He was devoted to a simple, rigorous mode of living. He is survived by his widow and two sons and two daughters.

T. P. LEE, 67, Houston oil man and capitalist died February 4 of a heart ailment of long standing.

Born in Petroleum, West Virginia, on March 19, 1871, Lee started work in the oil fields of West Virginia at 16. He moved to Texas in 1903 and entered the employ of The Texas Company at Sour Lake. Promotion was rapid and in 1913, when he left The Texas Company to become associated with Hogg, Autrey, Sharp and Woodward in the formation of Farmer's Petroleum Company, he was general superintendent of production. In 1916 Lee and his associates organized American Republics Corporation which he served as vice president and director. Lee resigned from the corporation in 1927. In 1915 he provided the capital for the organization of Yount-Lee Oil Company of Beaumont, a small enterprise that later realized millions through the discovery of deep oil at Spindle Top.

CHARLES F. HUFF, 56, general manager of the Preston Oil Company, Columbus, Ohio, and a director of the Pennsylvania Grade Crude Oil Association, died January 30 after being suddenly stricken with pneumonia. He was formerly employed by the South Penn Oil Company, had been general superintendent, a director and vice president of United Natural Gas Company, and general superintendent for Pennsylvania Gas Company.

B. E. BYRNE, 68, retired former vice president of The National Supply Company, died February 2 at Fort Worth. Born in West Virginia, Byrne started in the oil well supply business with The National Supply Company in 1904 at Beaumont and was later transferred to Houston at which point he had direct supervision over Houston, Humble, Sour Lake, and Beaumont stores. He remained in Houston in this capacity for approximately 15 years and with the arrival of new developments in Central West Texas, his headquarters were changed to Fort Worth. Shortly after his transfer, he became vice president of the company and directed the activities of his company's Texas Division for several years.

In 1922, he was moved to the executive headquarters of The National Supply Company at Pittsburgh where he was in charge of tubular sales. Due to failing health, he was later transferred to Los Angeles where he remained for several years and was then returned to Fort Worth where he retired from active service.

His death came after an illness of approximately 2½ years; the last year being spent in a hospital at Fort Worth.

ROBERT L. TYSON, 63, veteran employe of Sun Oil Company and head of the lease title department of the Dallas district, died February 6 at his Dallas residence. He had been ill for an extended period.

CLARENCE STRATTON JAMES, 72, pioneer oil man and from 1915 until recently with J. H. Markham, Jr., independent producer, died at his home in Tulsa January 29 after a three-day illness. James entered the oil business 50 years ago at Lima, Ohio, and for several years was secretary and treasurer of the Kansas Natural Gas Company.

CHARLES C. BENNETT, 84, organizer of American Royalty Petroleum Company at Tulsa, died January 30 at Deland, Florida, where he had gone to spend the winter months.

SUMNER J. JEWELL, 61, head of S. J. Jewell Royalties Company, Tulsa, died suddenly February 4 following a heart attack in his office.

J. CHARLES POULTON, 37, of Tyler, Texas, head of the southwestern division of Deep Rock Oil Company, died in Shreveport February 3 and was buried at Camden, Arkansas, February 5.

THE WEEK'S NEWS SUMMARIZED

Statistics

Despite a decline of 95,000 barrels daily in crude runs to stills, nearly 2,000,000 barrels of gasoline went into storage during the week ended February 4. This caused gasoline stocks to reach the dangerous level of 79,149,000 barrels. Economists have figured that the desirable economic level for gasoline storage on March 31 is 81,000,000 to 82,000,000 barrels. With 8 additional weeks before the end of March, it appears inventories are to be several million barrels too high. Market students, therefore, see a repetition of 1938, when prices were depressed throughout the year because of excessive refined product stocks.

This was the second consecutive week in which runs to stills have declined, but cold weather in the north and east has caused a sufficient consumption reduction to offset this trend.

Meanwhile, crude production climbed sharply during that week, and was 200,000 barrels above estimated market demand figures. This was due to Texas producing 6 days during the week, whereas 5 days of production are customary. Crude stocks, as a result, climbed 653,000 barrels, but were still 10.7 percent below a year ago.

The cold weather caused excellent fuel oil demand, and nearly two million barrels were drawn from storage. These stocks now are 15.9 percent higher than a year ago.

Prices

Conflicting trends developed in the oil industry's prices last week. Crude showed signs of strengthening, while gasoline was weakening.

Of importance was the restoration of recently lowered crude prices in some areas. Phillips Petroleum Company raised Panhandle postings 8 cents to conform with quotations used by other buyers. Bell Oil & Gas Company boosted North Texas oil 4 cents a barrel for the same reason. Bloomingdale, Michigan, prices were advanced 5 cents.

Additional Oklahoma distress oil found market connections during the week.

On the other side of the picture, was the reduction of 1½ to 2 cents per gallon in retail gasoline prices in Texas. This was an adjustment to put the area on a par with districts that suffered cuts last fall.

Some slightly lower prices for tank wagon gasoline shipments also occurred in the week.

Proration

The outstanding proration development of the week was the suggestion from Ernest O. Thompson, member of the Texas Railroad Commission, that Texas abandon the market-demand feature of its conservation laws. He declared the outlook for the sale of oil was most discouraging, and that the commission no longer could be expected to help in finding market connections for operators who drill too many wells.

Thompson further asserted that while Texas was holding an oil flood control gate over the world, Louisiana, California, Illinois and foreign countries were usurping the markets by dumping their production, and that they appeared to have better prosperity as a result.

His viewpoint attracted considerable attention, because of the approaching expiration of the state's conservation laws and his previous strong advocation of market-demand allocations.

Although the Texas Railroad Commission had fixed a proration order to extend through the month of March, and had set the next statewide hearing for March 15, a notice was issued suddenly for a hearing on February 20. This will be the first proration hearing since Jerry Sadler became a commission member.

Courts

The Rowan and Nichols suit charging East Texas proration methods were resulting in inequitable recoveries brought forth conflicting testimony when heard last week. Witnesses for the firm testified the use of potentials in determining allowables was not fair, especially in East Texas, as there was not a far enough spread to reward better wells.

In answer the state contended the Rowan and Nichols tract, being more densely drilled than the average in the area, was now permitted to produce more barrels per acre per day and was therefore treated fairly.

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Allowable Picture

Abandonment of market-demand proration feature is advocated by Texas commission member as only way to keep other areas from usurping state's markets

Abandon market-demand proration, suggests Thompson

Abandonment of the market-demand feature of Texas proration laws was advocated last week by Commissioner Ernest O. Thompson who feels that it may be the downfall of the Texas oil industry. He expressed his feelings at a hearing earlier in the week and said in part:

"I think the cause of our distress is proration; giving to the oil business a semi-stability, a kind of twilight zone between one danger period and another."

Thompson was speaking at a hearing concerning the problem of a spacing rule to limit wells in a new field. Turning to the question at hand, he emphasized the fact that the railroad commission will no longer be responsible for operators who drill too many wells.

"No matter what spacing rule we order, that doesn't make people drill wells. We put a 5-acre pattern at Amelia. We did just what the people wanted us to do and they did not get the wells. So they put a bunch of 5-acre tracts together, put their tracts together to get somebody to drill.

"It should be understood that the commission's spacing of a certain amount, say 20 acres, 10 or 5, or any amount, does not guarantee that a well will be drilled on those tracts. After all, the man who drills the well is going to have to figure out what is in the pay sands and see if he will get enough out of it to justify drilling the well and putting his money in the ground, and I must say, in all candor, that the present outlook is most discouraging for the sale of oil.

"It is no trouble to get a connection; we can compel pipe lines to run oil, but we can't compel anybody to buy it. So, when they say get a connection, they mean 'we have not been able to get anybody to buy our oil.' It is like shipping on the railroad. You have no trouble getting it shipped but when you ask the railroad to buy as well as transport, it becomes a different proposition.

"In spite of the fact that we have produced eleven and a half billion barrels of oil since 1925, we find ourselves with fifteen billion barrels uncovered and ready to be produced on the turn of a valve. We have produced eleven and a half billion barrels, more than twice as much as we had in 1925, while we find ourselves with three times as much crude ready to be used.

"Then, to make it worse, the technological progress in refining has been such that today they get more than twice as many gallons of gasoline out of a barrel of oil as we did in 1925. And there was a new process discovered last year and two plants are being completed where they can get up to 70 percent or better, and further than that they can cut it just as they want, and a process has been developed now where they can get 100 percent recovery; 42 gallons of gasoline out of 42 gallons of crude. So, with twice as much recoverable gasoline now possible, and with three times as much oil available, we are six times better off than we were in 1925.

Through Finding Markets

"I only mention that to put clearly before this hearing and in the record our present plight. The commission does not sell oil; it is not our duty to sell oil; we don't have the authority to sell oil. All we can do is to try to write reasonable rules and regulations for the drilling of wells with the sole purpose of preventing actual, cognizable physical waste in the production of it, and when we do that all our power has been exerted and exhausted.

"There is a prevalent feeling that the commission can help get connections. Last fall, when people were in such pitiful plight with thousands of wells wanting purchasers, we did wire around and ask people 'Won't you please buy this oil.' We had some success.

"The fact is that we got every well in the state connected; in November there wasn't a single unconnected well in the state, but we are warning the world and issuing the statement right this minute that this commission is through finding markets because we know we can't do it. Having done it once with success, we are going to rest on our oars.

"We should not have done it then. We know that we can't do it now, and we are warning everybody that we cannot do it. No matter what spacing rule comes out of the hearing, please don't ask the commission to sell the oil because we do not have the authority and it is a physical impossibility. There is much more oil than anybody wants.

"We have now reached that point, having come through that period of semi-stability, with proration holding production down and incidentally, causing the price to appear to be firm and attracting to the oil industry great funds over a long time at low rates of interest; anybody that had anything like a producing piece of property could get some money, all of it, to drill a well, but now the time has come to pay it back.

"The price of oil has started down. It dropped a quarter last year when production was well within consumption. As a matter of fact, we had ourselves prorated down so low that we were 200,000 barrels a day under the estimated market demand of the Bureau of Mines. We did that so that the so-called overage of supply on hand could be drawn down.

"You would think when you were producing less than you were consuming you would have a firm situation. That is what they call the statistical position of the industry; not only production in balance but well below consumption. What happened? The price broke.

"While we hold the umbrella over the world, other countries are dumping their production and producing oil and taking the foreign markets that we formerly enjoyed. It is almost the same thing that happened in cotton. The government, in its plan to assure prosperity to the farmers, advanced money on cotton on warehouse receipts, and we had a period of stability; we thought everything was lovely, but pretty soon they began to raise cotton in other countries of the world because of the good price. So what happened? We lost our cotton business.

"There is no substitute of regulation for good management. Happily, the commission does not have to guarantee that these wells will be a profitable investment. It seems that the only way people can learn to be prudent is to go broke."

Speaking privately, Thompson pointed to the prosperity of California and Louisiana especially, states where there is far less regulation. Illinois, likewise, is doing well, he said, and suggested that Texas producers might do far better if they were permitted to produce as much oil as they liked, as long as it did not cause waste.

Meanwhile the first hearing on Texas conservation laws and their extension has been set by the legislature for February 15 at Austin.

Texas hearing attracting unusual interest

The Texas statewide proration hearing scheduled by the Texas Railroad Commission for February 20 at Austin promises to be one of the most unique in the commission's history. Although the commission had fixed a proration order to extend through the month of March and had set the next hearing for March 15, a notice was issued suddenly calling for a hearing on February 20.

Commissioners Sadler and Smith explained that the purpose of this hearing was to adjust the differences and inequities in allowables between wells within fields, and between fields within the state. Commissioner Thompson said he saw no particular need for the hearing, but pointed out that the hearing on gas is required every month.

Attorneys, consulted about the hearing, explained that because of the text of the notice, all factors ordinarily discussed in the regular statewide hearings would be in order and that operators planning to protect themselves fully must be prepared to defend allowables, or ask for allowables, on the basis of waste and market demand.

Efforts to obtain information concerning the inequities mentioned in the order met with no success and the commissioners declined to indicate whether special petitions had been

filed that had led them to take this action.

Since this is the first proration hearing since Commissioner Sadler has been sworn in, and it appears that he was instrumental in having it called at this time, operators have shown unusual interest in the meeting.

Illinois continues study of conservation

The Illinois House Committee for conservation of natural resources last week named a special sub-committee to work with the legislative reference bureau in drafting legislation to eliminate grievances of individuals and groups in the state's southern oil fields.

The action was taken by Representative Oral P. Tuttle, Republican of Harrisburg, committee chairman, after R. J. Branson, Republican of Centralia, told the committee he had received a large number of letters complaining about "bootlegging" of oil from tanks at night, unpaid labor, offset wells and wells on small school and church leases.

Members of the sub-committee are: S. C. Dale, Fairfield; John R. Thompson, Bridgeport; Reed F. Cutler, Lewistown, and Harold D. Kelsey, Barrington, Republicans; and Sidney Parker, Texica, and Frank Ryan, Chicago, Democrats, and Tuttle.

California conservation measure introduced

Strong lines were forming last week both for and against the conservation bill introduced to the California State Legislature.

It is an act to prevent waste of crude petroleum, natural gas and products; creates an oil conservation commission, which is authorized to prescribe operating rules and to regulate production. Penalties are provided for the violation of the provisions of the act. A tax would be levied on both oil and gas to pay the cost of administration and enforcement of the act.

Kansas governor recommends compact continuance

Continuance of Kansas as a member of the Interstate Oil Compact Commission will be recommended to the Kansas legislature by Governor Payne H. Ratner, who last week made the announcement after consultation with members of the oil advisory committee, which he named shortly after taking office.

Kansas gas proration

Kansas State Corporation Commission has established February natural gas allowables for the major fields of the state. For Otis, Rush and Barton counties, the order is 1,035,000,000 cubic feet, for the month. Lyons field of Rice County is given an order for 336,000,000 cubic feet, and Burrton field of Reno County obtained a dry gas order of 423,000,000 cubic feet for the month. The figure for Hugoton, the state's largest gas area, was set at 2,633,000,000 cubic feet.

Oil at the Capitols

Texas operators reporting output from a dead well may face felony charge . . . Wyoming threatens to take action unless retail gasoline prices adjusted

Would be felony to report production from dead well

A bill making it a felony to report production from a dead well has been introduced in the Texas legislature by Representative Omar Burkett of Cisco.

The principal section of the bill is set out below:

Section 1: That from and after the effective date of this act it shall be unlawful for any person, agent or attorney, knowingly to make any false statement in writing to any department in this state in which such person, agent or attorney falsely makes any declaration for the purpose of securing increased allowable under the proration laws of this state or under any proration order issued by the Texas Railroad Commission or any other department having authority to issue any such order or require such report; or who shall, knowingly, make any false statement in such report so as to secure or have allocated allowables of oil and/or gas for any non-producing or dead well in this state or shall by any false and/or fraudulent device or scheme connect any non-producing or dead well to a producing well and/or shall fraudulently represent production from said non-producing well, whether said connection be visible or by any subterranean device or connection.

Fines of $1000 to $5000 and prison sentences up to three years could be assessed against violators.

Under a bill introduced in the Texas legislature by Representative J. J. Oliver, abandoned mineral leases and royalties would revert to the owners of the surface rights after a period of 10 years.

Washington State has oil control ambitions

A measure empowering the Washington state director of conservation and development to assume control of the state's oil and gas industry to an extent necessary to stop waste and over-production was introduced in the senate at departmental request last week by Senator Alfred E. Holt, Democrat of Spokane.

The director would be given power to set production quotas for all fields and wells and would be required, when limiting production, to prorate the allowable production between fields and wells. To guard against abuses in a particular pool, he would be empowered to limit the number of wells any one owner may drill and set minimum production figures in order to prevent premature abandonment. Certificates of legal production would be required of oil carriers to prevent bootlegging.

Administration of the act would be paid from revenue of a tax of one-eighth of one percent of the gross value of oil or gas produced in the state.

Wyoming lawmakers alarmed over gasoline price situation

Since declaration by Governor Nels Smith of Wyoming in his message to the state legislature early in January that gasoline prices "are out of line with th prices in adjoining states," the legislature has been torn between proposals to investigate the oil industry, to declare the industry a public utility or to appropriate $500,000 to place the state in the gasoline business.

"I see no reason why the people of Wyoming should pay more for any product manufactured within the state than is charged for the same product after it is shipped many hundreds of miles to the users of other states," Smith told the legislature.

Early in the session, a resolution calling for an investigation of oil and gas prices was introduced. Its passage by the house of representatives was indicated when approval was given in committee of the whole, but last week the house reversed itself and killed the resolution by a vote of 33 to 22.

Asks Companies to Adjust

Meanwhile, the governor has been meeting with oil and gas company representatives in an effort to obtain a voluntary adjustment of the alleged discriminatory charges. It was indicated that some solution to the price situation, as yet unannounced, had been found and caused a shift in house votes.

A recommendation for defeat of a bill introduced by Representative Clyde A. Smith, Democrat of Casper, that the gasoline industry be defined as a public utility was given by the house committee on corporations. Smith suggested that gasoline be described as a product of utility plants as it, like natural or manufactured gas, can be used for light, heat or power.

"Justification of such a change is found in the situation that by some equitable adjustment of rates, the gasoline price wars would be eliminated and it would have the effect of discouraging the use of out-of-state gasoline in competition with Wyoming products," Smith said. "If passed, the bill will give the governor and the public service commission the power needed to make available to Wyoming people the products of their own state on parity with the prices charged for the same product in distant markets."

The latest proposal would provide $500,000 for establishing the state in the

gasoline business. The measure would empower the five state elective officials to engage in the refining and selling of gasoline and other petroleum products. The measure has also been given an unfavorable committee report.

Texas legislature starts work on tax legislation

The first hearing on major tax legislation for the Texas legislature has been scheduled for February 15 when the O'Daniel transaction tax bill will be up for consideration. The House Committee on Revenue and Taxation and the House Committee on Constitutional Amendments will hold a joint hearing to which Governor O'Daniel will be invited.

At subsequent hearings the committees will invite comment on other tax bills, including the numerous natural resource revisions which have been proposed.

Texas public land sales suspended pending law change

The Texas legislature last week approved, and Governor Lee O'Daniel signed, a bill withdrawing from the market public school lands until 90 days after the adjournment of this session of the legislature.

The suspension measure was rushed through to prevent further sales during the time the legislature has before it a program for revision of all the land laws.

Want more money for California litigation

Legislation under which the courts have denied the government interest in the Section 36 case, passed in 1935, will be contested by the Department of Justice, it was disclosed this week in testimony of Charles E. Collett, special assistant to the Attorney General in charge of the Section 36 and Section 16 cases.

Appearing before the House Appropriations Committee to ask for a fund of $26,500 for expenses during the coming fiscal year, Collett declared between $6,000,000 and $8,000,000 is involved in the interest claim, and contended that the 1935 statute was "passed specially to defeat our claim to interest in this case."

"It was passed by the legislature in 1935 and in construing the act the court held that the state had the right to allow or disallow interest in conversion actions," he explained. "We are contesting that."

There is little possibility, Collett told the committee, of the case reaching the Supreme Court before next fall. Both sides have appealed, the government arguing that certain offsets given Standard Oil Company should not have been allowed and the oil company claiming additional offsets of approximately $2,000,000. The appeals concern a decree rendered February 11, 1938, awarding the lands to the government with a judgment in damages of $6,214,102.42.

The litigation, instituted under a joint resolution approved February 21, 1924, so far has cost $355,766, it was stated.

Oil in the Courts

Witnesses divided in thought regarding inequities resulting from East Texas field proration methods

Briefs must be filed in Rowan & Nichols suit

Trial of the Rowan & Nichols suit involving the validity of the East Texas proration order was concluded before Federal Judge R. J. McMillan Friday. The court announced that he would allow 22 days for the preparation and filing of briefs.

Attorneys were requested to outline facts in the case in these briefs. The court indicated that he was anxious to arrive at a decision while the case was fresh in his mind.

As the hearing came to a close Dan Moody, attorney for Rowan & Nichols, said that if an injunction is entered as his company sought, it would not apply to all operators in the field. He said further that the maximum allowable sought by Rowan & Nichols was 220 barrels. These stipulations were made at the request of the court.

In closing Moody insisted that his client would not be protected unless the Railroad Commission proration order permitted Rowan & Nichols to produce an amount of oil in proportion to the acre-feet of producing sand beneath the 25-acre tract.

The suit was brought by Rowan & Nichols, who alleged that the proration order in the East Texas field, as promulgated by the Railroad Commission, did not give them an equal opportunity to recover their fair share of the oil. Evidence presented indicated that the company thought it was entitled to produce in proportion to the reserve originally in place beneath the 25-acre tract in question. Conversely, smaller tracts in the field, and especially the R. M. Wood one-acre lease offsetting Rowan & Nichols, on which a well has been drilled recently, should have allowables reduced, presumably in that proportion that the acreage in the tract bore to the total productive acreage in the field.

Witnesses testified for Rowan & Nichols that the use of potential in determining allowables was not a fair method, especially as applied in the East Texas field, where there was far too small a spread in the allowables for the best and the poorest wells. They pointed out that with a top allowable on the field, which they felt was proper, the distribution of 20 barrels to each well as a primary basis of allocation left only 7000 barrels to be distributed among the best wells in proportion to their capacity to produce.

Answering these arguments, attorneys for the State contended that the Rowan & Nichols lease, being more densely drilled than the average of all the leases for a wide area around, was now permitted to produce more barrels per acre per day and was therefore fairly treated on an acreage basis. In addition to this, they pointed out that some 350,000 barrels had been produced from the tract, but that a large part of this must have come from other leases in the oil field since the water table had not risen under the tract sufficiently to displace that amount of oil.

Labor Situation

Tension in Tulsa becomes greater as Mid-Continent strike activities grow more violent and numerous

Arbitration hopes given up in Mid-Continent strike

Between 8 and 8:30 o'clock the morning of February 4 an explosion rocked Tulsa with sufficient force to make wall pictures quiver and window panes rattle. Office workers still on the street halted momentarily and those who did not say the words at least thought "it's the refinery." Those in buildings rushed to windows to witness what had taken place in the plant of the Mid-Continent Petroleum Corporation across the Arkansas river. The refinery was operating as usual with all equipment and buildings in place.

The explosion proved to be the destruction of a nitro glycerine magazine near Turley, seven miles from Tulsa.

It proved also that one city was living at high tension because of a strike. Before another week had passed, labor differences between Mid-Continent Petroleum Corporation and members of the International Oil & Gas Workers Union had shifted into a stage of high tension. Another pipe line near Seminole was broken by an explosion, gasoline pumps at service stations in Tulsa had been damaged, encounters between working employees and striking workmen had become more numerous and more violent.

Late last week officials of the union

intimated that they had given up all hope of arbitration as a means of settling the controversy and that high ranking officials of the union would come to Tulsa to direct activity of the strikers. Harvey C. Fremming, union president; E. C. Conarty, secretary-treasurer; B. J. Schafer, vice president; and Dave Fowler, regional director of C.I.O. are those scheduled to gather in Tulsa to outline a campaign for what local union officials designate as a "finish fight."

This course is to be pursued regardless of the outcome of a charge pending before the National Labor Relations Board and regardless of charges that may be filed with the board. The charge pending is that the corporation refused to arbitrate. The charge contemplated is that the corporation discharged employees because of union affiliation. Although no date has been set for a hearing on the arbitration charge, it is due for consideration as soon as the board can designate an arbitrator for the hearing.

Side light of the strike was forfeiture of bonds of 11 strikers, who appeared at the Tulsa County jail and asked to remain there pending trials. A state representative from Tulsa County is attorney for union members and trials growing out of fights have been postponed until the session of the Oklahoma legislature ends. A report from Seminole County was that W.P.A. rolls had increased by 25 percent there with the strike responsible.

Market Situation

Runs to stills decrease again but gasoline stocks continue rising . . . Gasoline prices are slightly weaker but crude shows some signs of strengthening

Conflicting developments puzzle marketers

The market picture during the past week offered several puzzling angles. A decrease in crude runs to stills, a slight increase in crude stocks, higher gasoline stocks, lower retail gasoline prices in Texas, continuation of excessive crude oil production, and a stiffening of crude oil prices in North Texas and South Oklahoma were developments difficult to interpret from a future standpoint. The winter season, period of low gasoline consumption, usually finds markets vulnerable, and the cross currents of the past week were about equally divided from a seasonal standpoint.

The decline of 95,000 barrels daily in crude runs to stills did much to offset less favorable factors. However, gasoline stocks continued to soar, while gas and fuel oil stocks dropped appreciably with better consumption.

The tendency of several crude oil purchasers to restore prices that were lowered recently was an important development last week. Phillips Petroleum Company, leading Panhandle purchaser, raised prices on both sweet and sour crudes 8 cents per barrel to conform with quotations used by other buyers. The demand for Panhandle crude has improved since February 1.

Tri-Lakes Corporation, subsidiary of Standard of Ohio, posted a 5-cent per barrel advance in Bloomingdale grade prices January 30, bringing postings up to 78 cents per barrel. Naph-Sol Refining Company followed. Prices in other Michigan fields were not affected.

Michigan Increase

Tri-Lakes buys about 11,000 of the 15,000 barrels being produced in the Bloomingdale district, Van Buren County.

Bell Oil & Gas Company announced a restoration of four cents per barrel in the price of Burkburnett, North Texas and Red River district crude, to offset the cut effective January 3. The new price range starts at 71 cents for 28 to 29.9 gravity, with a 2-cent differential to 97 cents for 41 gravity and above.

Distress oil has been absorbed in certain Oklahoma fields. California hopes to hold its production in line until an improved market demand absorbs the surplus now held.

The reduction of 1½ to 2 cents per gallon in retail gasoline prices in Texas was an adjustment that was expected last fall. Other districts posted lower retail prices during the latter part of 1938.

The necessity for holding crude oil production and crude runs to stills in line with market demands is apparent. An excess in either department is reflected in surplus stocks that endanger the refined market.

Runs to stills decline but gasoline stocks continue rising

Despite a decrease of 95,000 barrels daily in refinery runs, gasoline stocks continued to soar during the week ended February 4. A ray of hope was seen in the slight downward trend of runs to stills, but the sharp upward continuation of gasoline stocks brought the total on hand to a dangerous level. Crude runs to stills dropped to 3,140,000 barrels daily, from 3,235,000 barrels daily during the previous week. Gasoline stocks jumped to 79,149,000 barrels, an increase of 1,824,000 barrels during

Pipe Line News

North Permian Basin fields of West Texas to get one badly needed outlet, and expect another one

Aloco to build 30 miles of 6-inch line to Hobbs

Construction of a 30-mile 6-inch crude line from the Wasson field, Yoakum County, to the Hobbs field, New Mexico has been authorized by Aloco Oil Company, Dallas. Preliminary work is slated to begin this week. The line will connect with the Atlantic Pipe Line Company's Hobbs-Atreco, Texas, trunk system, and deliver oil to the Atlantic Petroleum Purchasing Corporation, which has contracted to purchase a maximum of 5000 barrels daily for 5 years from the Aloco Oil Company.

An extensive field gathering system will be necessary for Aloco Oil Company to connect to the 9 scattered producing leases acquired from The Texas Company under an option taken last December. A branch line to the Bennett field, Yoakum County, is also contemplated. However, it will be deferred until more wells are completed on Aloco Oil Company's leases in that sector.

Shell Pipe Line Corporation is expected to issue construction orders shortly on the crude line reported the past week as being contemplated for the Bennett and Wasson fields. Right-of-way is being taken for an 8-inch line to Hobbs.

Three lines in prospect in Corpus Christi area

Construction of three new pipe lines to the Corpus Christi ship channel within the immediate future was considered assured with surveys underway for the first two and currently accepted as fact. The lines will total 68 miles in length and will provide much needed outlets for several areas.

Republic Pipe Line Company is surveying eight miles of right-of-way, including a crossing through Nueces Bay, from the East White Point field in San Patricio County to the company's terminal on the Corpus Christi ship channel. The line will be 8 miles long and 6-inch welded pipe. Plymouth Oil Company, an affiliate, is the discoverer and principal producer in the area. Republic Pipe Line Company has been running the oil via a 4-inch line to the company's Sinton-Corpus Christi system.

A right-of-way is being surveyed from the new LaRosa field in Frio County, to the Corpus Christi ship channel for the construction of a line, reportedly 6-inch. It is not known for whom the line will be built, but it

[*Continued on page 66*]

That the FACTS DRILLING

Judge James C. Wilson, Judge of the United States District Court for the Northern District of Texas, at Ft. Worth, filed his opinion in the case of the Hughes Tool Company vs. United Machine Company, et al, holding the patents in suit in that case owned by Hughes Tool Company were valid and infringed by the defendants, the United Machine Company. The following excerpts are taken from that opinion:

"Defendants are exclusively in the business of repairing, as they call it, plaintiff's bits. They contend that even though the claims relied upon are held to cover the accused devices, their acts here complained of do not constitute infringement of the patents in suit, under the rule of permissible repair.

"It is plain both in principle and in view of the pertinent decided cases that this rebuilding or any building-up of the worn teeth of the cutters is not a mere 'sharpening' of the cutters as defendants contend, but is a reconstruction that infringes the claim relied on of the Scott & Wellensiek patent No. 1,647,753 and the Fletcher patent, No. 1,856,627 respectively. When the cones are mounted to 'interfit,' it is an infringement of the Scott patent, No. 1,480,014, as well. The use by the defendants of metallic material of the used bits to make these devices is no less an infringement than would be the use of new metal therefor.

"The same observations are applicable to the bearing patents in suit in respect to the building up of the used device with new metal in the worn ball raceways or roller raceways or similar parts.

"The defendants contend that since they in instances worked on Hughes Tool Company bits at the request of drillers possessing them, they should not be held for infringement. This is unsound. I have pointed out that what defendants did was to reconstruct and without right. The drillers had no such right and would not have possessed it had title to the bits been in them. Of course a pat-

may be Known to the INDUSTRY

ented device may be repaired without infringement, if what is done is repairing in the sense of that word as applied to patented articles. The truth is what the defendants do is not repairing in any sense. It is rebuilding.

"As further bearing upon this issue, the plaintiff adduced testimony to show that defendants have no right to rework the Hughes bits because they are the property of the plaintiff. That evidence shows that title to the bits remains in plaintiff at all times.

"The defendants could, therefore, acquire no right to either repair or reconstruct from the driller as the driller had no such right to exercise or to transfer. Indeed, the driller is obligated to turn the plaintiff's bits back to the plaintiff and to no other.

"It follows that the defendants' conduct is without right on this ground alone, though as has been pointed out, infringement by the defendants has been clearly shown by the consideration hereinbefore set forth."

FOR 30 years HUGHES TOOL COMPANY has accepted as its obligation—the making available to the Drilling Industry of a safe, fast, economical Rotary Rock Bit.

Drilling requirements have been anticipated; lower footage costs assured—year by year; a new and better Hughes Rock Bit always "in the making."

This continuous program of laboratory and field experiments, involving enormous expenditures, can be continued only so long as the results of research and invention are available for further experiment and development.

HUGHES TOOL COMPANY
HOUSTON, TEXAS

the week. The present total is 8½ percent below that of a year ago, but considerably above the necessary level.

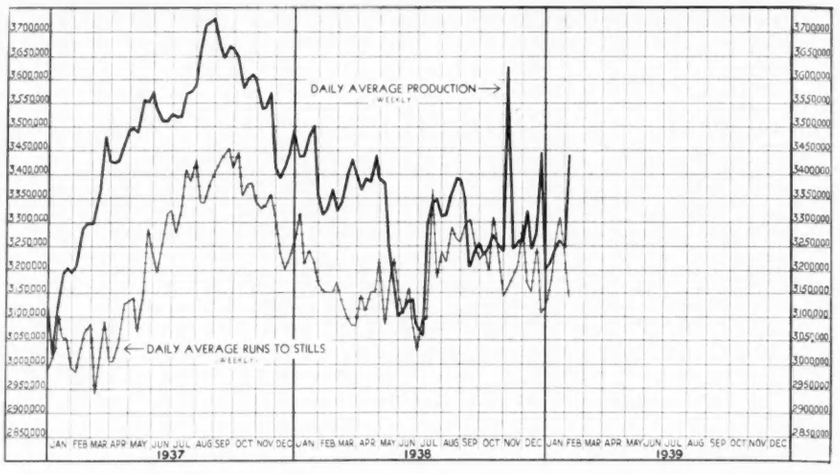
The latest weekly statistics showed a sharp increase in crude production. The flow jumped 193,700 barrels daily to 3,441,950 barrels as a result of Texas' boosting its run from five to six days a week.

The output was about 220,000 barrels above the indicated market demand for domestic crude, as estimated for February by the Bureau of Mines.

Gas and fuel oil stocks were reduced further by approximately two million barrels, having declined to 137,589,000 barrels. These stocks are now 15.9 percent higher than a year before.

Crude oil stocks at the close of the week ended January 28 totaled 271,763,000 barrels, an increase of 653,000 barrels during the week. At this new figure crude stocks were 10.7 percent lower than a year ago. The tendency of crude oil stocks to remain at a reasonable level is one of the brightest spots in the petroleum picture.

United States Crude Oil Production and Refinery Runs



Few changes made in refined product prices

The refined market in the larger distribution centers did not suffer severe declines during the week, and on the whole prices compared favorably with those of the previous week. Colder weather in the north favorably affected fuel oil sales and current prices promised to hold.

Gasoline prices in the Oklahoma and Chicago districts fluctuated little during the week, but sales were confined largely to the lower fractions in each price range. The winter demand has been good.

Gasoline Prices

U. S. motor gasoline ranged in the Oklahoma market last week about as follows: 62 octane and below, 3⅝ to 4¼ cents a gallon; 63 to 66 octane, 3⅞ to 4½ cents; 67 to 69 octane, 3⅞ to 4⅝ cents; 70 to 72 octane, 4⅛ to 5 cents.

Corresponding prices in the Chicago market were 3¼ to 4 cents, 3½ to 4½ cents, 3¾ to 4½ cents and 4 to 4⅝ cents.

In East Texas, 60-62, 400 end point gasoline was priced generally at 4 cents a gallon.

Kerosene prices f.o.b. Oklahoma refineries ranged from 3⅞ to 4¼ cents a gallon for the 41-43 water white grade, and from 4 to 4⅝ cents for the 42-44 water white grade; and corresponding prices in the Chicago market were 3½ to 4⅛ cents and 3⅝ to 4⅜ cents.

Natural Gasoline

Natural gasoline, grade 26-70, was priced generally in the Mid-Continent markets f.o.b. refineries at 2¾ cents a gallon, and sales were reported at the same price, f.o.b. Breckenridge, Texas.

Fuel oil prices were down ⅛ cent a gallon in a few instances last week. In the Chicago market range oil was priced from 3⅜ to 4 cents a gallon. The No. 1 white oil was priced from 3⅜ to 3⅞ cents, and No. 1 straw from 3⅜ to 3¾ cents. No. 2 straw was 3¼ to 3⅝ cents. No. 3 oil was 3 to 3⅜ cents. No. 5 oils were 57½ to 65 cents a barrel. The No. 6 oil was quoted at 30 to 45 cents.

Trends of United States Production and Stocks

Figures are from American Petroleum Institute weekly reports, except those on crude stocks, which are from Bureau of Mines weekly reports

WEEK ENDED	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stocks (Barrels)	Gasoline Stocks (Barrels)	Gas & Fuel Oil Stocks (Barrels)
September 25, 1937	3,666,300	*3,455,000	307,974,000	65,620,000	116,472,000
January 1, 1938	3,436,600	3,320,000	303,468,000	77,291,000	118,660,000
January 29	3,357,650	3,170,000	304,286,000	84,844,000	118,793,000
February 26	3,322,800	3,170,000	305,167,000	90,719,000	120,958,000
March 19	3,322,550	3,080,000	306,380,000	*93,192,000	122,067,000
March 26	3,405,600	3,080,000	307,557,000	92,858,000	122,979,000
April 30	3,396,150	3,215,000	307,147,000	91,339,000	128,270,000
May 28	3,098,650	3,150,000	301,583,000	87,946,000	134,315,000
June 25	3,083,900	3,025,000	293,463,000	82,412,000	137,801,000
July 30	3,316,400	3,240,000	288,514,000	76,864,000	144,294,000
August 27	3,388,500	3,255,000	285,029,000	71,754,000	146,926,000
September 24	3,251,150	3,220,000	280,278,000	68,605,000	150,468,000
October 1	3,231,800	3,235,000	280,852,000	68,602,000	151,759,000
October 29	3,237,500	3,145,000	275,824,000	67,590,000	153,719,000
November 12	3,243,250	3,180,000	273,394,000	67,551,000	*154,666,000
November 26	3,260,900	3,295,000	270,563,000	68,628,000	153,634,000
December 10	3,245,100	3,150,000	†269,509,000	68,587,000	150,779,000
December 31	3,201,450	3,115,000	273,024,000	71,695,000	144,823,000
January 7, 1939	3,214,900	3,170,000	272,325,000	72,818,000	143,333,000
January 14	3,243,600	3,260,000	271,819,000	73,752,000	142,460,000
January 21	3,264,450	3,310,000	271,110,000	75,455,000	141,091,000
January 28	3,248,250	3,235,000	271,763,000	77,279,000	139,349,000
February 4, 1939	3,441,950	3,140,000	.....	79,149,000	137,589,000
February 5, 1938	3,316,450	3,155,000	‡304,494,000	86,484,000	118,619,000
Change in past year	+3.8%	—0.5%	—10.7%	—8.5%	+15.9%

* All time peak. † Lowest for 17 years. ‡ Stocks, January 29, 1938.

Full purchases resumed in Oklahoma-Kansas area

Resumption of 100 percent purchases from 1056 leases in the stripper wells area of Eastern Oklahoma and Eastern Kansas was begun by National Refining Company last week. The move followed a deal between this concern and Phillips Petroleum Company, which will take 70,000 barrels of oil each month and pay the posted price plus gathering charges of National Refining Company.

Three weeks ago National Refining Company, whose western refining plant is at Coffeyville, reduced its purchases in the two states to 70 percent of production.

Expect Shelby refinery to stabilize Montana crude

Reports that Socony-Vacuum Oil Company would enter Montana with construction of a 2000-barrel capacity refinery at Shelby to handle the output

of 18 producing companies in the Kevin-Sunburst field are considered by informed sources as likely to have a permanent effect on stabilizing Montana crude prices.

Action of the company, first such move by a major company, is expected to be the forerunner of similar action by other large companies. Construction of the plant follows almost two years of negotiations conducted by a group of producers headed by J. W. Johnson. The 18 companies involved in the deal and whose production will be taken by the refinery operate 39 leases on which 117 producing wells have been drilled.

The plant will be constructed on a 72-acre tract at the western edge of the Shelby city limits. It will be a thermal cracking plant, with provisions made for changeover to the Houdry catalytic type of refining if conditions justify. The Socony - Vacuum Oil Company markets its products throughout Montana.

Montana operators, who in the past have been disposing of considerable crude to Canadian companies, lost their northern market about a year ago with rapid growth of Alberta's Turner Valley field.

J. J. PERKINS, Wichita Falls oil producer and civic leader, was honored February 7 in Dallas by the board of trustees of the Southern Methodist University for having contributed $75,000 for the erection of an administration building for the latter institution.

Crude Production

United States output drops 163,275 barrels daily to 3,263,075 barrels; still above Bureau estimate

Output of the oil fields of the United States during the week ended February 11 declined to 3,263,075 barrels daily. That was 163,275 barrels less than the daily average for the preceding week but 43,075 barrels higher than the demand for domestic crude estimated by the Bureau of Mines.

This large decrease is attributable to a reduction in Texas production of 202,850 barrels, from 1,495,950 barrels to 1,293,100 barrels daily. At this level it was 48,230 barrels less than the state allowable and 4,400 barrels less than the Bureau estimate.

California gained 8,700 barrels over the preceding week's daily average to total 617,500 barrels daily, exceeding the recommendation of the Central Producers' Committee by 12,500 barrels and the federal allocation by 37,500 barrels.

Louisiana's output for the week climbed to 263,775 barrels daily to exceed the preceding week by 3,500 barrels and the state and federal allocation by 8,635 barrels and 16,975 barrels respectively.

All other producing areas also registered increases. Oklahoma production rose to 433,200 barrels daily to exceed the previous week by 10,200 barrels and the state allocation by 5,200 barrels. Kansas production jumped from 140,125 barrels for the week preceding to 144,600 barrels. At this level it was 9,300 barrels less than the state allowable.

The newer pools in Illinois continued their climb as production rose from 130,400 barrels for the preceding week to 140,200 barrels daily for the week just ended.

Cayuga provided with market outlet

Dallas.—The crude market for the Cayuga field, East Texas low gravity area, will be restored to a normal level on February 15 when Pan-American Pipe Line Company begins purchasing

United States Crude Oil Production

Estimates Compiled by The OIL WEEKLY

DISTRICT OR STATE	Bureau of Mines Recommendation (Daily in Feb.)	State Allowable in Feb.	BARRELS DAILY FOR WEEK ENDED Feb. 11	Feb. 4
TEXAS—				
Texas Panhandle			62,900	65,900
North Texas			80,100	87,700
West Central Texas			30,800	31,850
West Texas			205,900	239,800
East Central Texas			92,100	101,700
East Texas Field			373,400	447,150
South Texas			234,800	280,700
Texas Gulf Coast			213,100	241,150
Total Texas	1,297,500	1,338,330	1,293,100	1,495,950
CALIFORNIA—				
Long Beach			48,700	50,100
Santa Fe Springs			29,400	30,000
Huntington Beach			27,800	26,400
Dominguez			21,600	21,500
Ventura Avenue			33,900	33,300
Midway-Sunset			49,400	49,700
Kettleman Hills			54,100	56,700
Wilmington			85,100	83,900
Others			267,500	257,200
Total California	580,000	605,000*	617,500	608,800
OKLAHOMA—				
Oklahoma City			100,950	90,925
Seminole Area			95,075	95,075
Fitts			31,425	32,775
Others			205,250	204,225
Total Oklahoma	482,500	428,000	433,200	423,000
LOUISIANA—				
North Louisiana			72,375	69,375
South Louisiana			191,400	190,900
Total Louisiana	246,800	255,140	263,775	260,275

DISTRICT OR STATE	Bureau of Mines Recommendation (Daily in Feb.)	State Allowable in Feb.)	BARRELS DAILY FOR WEEK ENDED Feb. 11	Feb. 4
KANSAS—				
Burrton-Haven			8,725	8,175
Russell County			7,600	20,700
Silica			20,875	8,150
Others			107,400	103,100
Total Kansas	148,600	153,900	144,600	140,125
NEW MEXICO	99,600	102,600	101,500	98,600
MICHIGAN	47,200		51,400	50,600
ARKANSAS	48,200		53,150	52,350
MOUNTAIN STATES—				
Wyoming	57,100		48,600	49,100
Montana	12,100		13,100	13,900
Colorado	3,600		4,050	4,100
Total Mountain States	72,800		65,750	67,100
EASTERN STATES—				
Pennsylvania Grade			65,700	66,400
Southern Illinois (New Pools)			140,200	130,400
Illinois-Indiana (Old Pools)			6,800	6,900
Others, Eastern			26,400	25,800
Total Eastern States	196,800		239,100	229,500
Total United States	3,220,000		3,263,075	3,426,300

*Recommendation of Central Committee of California Oil Producers.

† Daily average, considering Saturday and Sunday shut-downs.

6000 barrels daily on a full month basis. Tide Water Associated Oil Company is to nominate 1500 barrels daily, thereby giving the field an outlet for 7500 barrels daily in contrast to only 2000 barrels daily since January 1. The field's 250 oil wells have a proration allowable of 10,790 barrels daily for February, but this is subject to production holidays.

A compromise was reached between Pan-American Pipe Line Company, which is buying the oil for Pan-American Refining Corporation's plant at Texas City, and the Cayuga operators regarding contract terms. Amerada Petroleum Corporation, Roeser & Pendleton, Inc., and Seaboard Oil Corporation contracted to sell their allowable for two years at a posted price of 68 cents per barrel at the well. This price is subject to a 10-cent fluctuation, based upon prices quoted for Talco, Smackover and other asphalt sources.

Numerous small producing units at Cayuga were not required to sign the contract, but will be served with a market on the above price terms.

U. S. annual report shows 1938 drop

United States production of crude petroleum in 1938 dropped 65,906,000 barrels under the 1937 output, totaling 1,213,254,000 barrels against 1,279,160,000 barrels, it was reported February 9 by the Bureau of Mines.

Daily average production for the year was 3,324,000 barrels against 3,505,000 barrels in 1937, it was stated.

The bureau's preliminary figure on the year's production was issued in connection with its monthly report showing that daily average output in December was 3,299,600 barrels, compared with 3,285,600 barrels in November and 3,446,000 barrels in December, 1937.

Total output for the month was 102,287,000 barrels against 98,567,000 barrels in November and 106,829,000 barrels in December of the preceding year.

The principal change in the state situation in December, the bureau stated, was an increase in daily average production in Illinois from 102,200 barrels in November to 128,400 barrels, partially offset by small declines in California, Louisiana, Kansas and other states.

"The total demand for all oils declined slightly (39,000 barrels daily) in 1938, as increases in exports could not overcome the decline in demand for fuel oil," the report commented. "Due to more stringent proration east of California, crude-oil production was curtailed and the total for the year declined from 1,279,160,000 barrels in 1937, to 1,213,254,000 barrels in 1938. The apparent deficiency in supply is explainable in stocks of all oils, which declined from 564,997,000 barrels at the beginning of the year to 555,263,000 barrels on December 31, compared with an increase of nearly 50,000,000 barrels in 1937."

The yield of gasoline, which had been averaging considerably above normal, declined to 44.4 percent in December from 45 percent in November, the bureau reported, and the yield for 1938 was 44.3 percent against 43.9 percent in 1937.

Gasoline Consumption

"Gasoline consumption continued its late season recovery," the bureau continued, "the idicated domestic demand for December being 41,649,000 barrels, or 6 percent higher than in December, 1937. This increase insured a new record for 1938 of 521,657,000 barrels, compared with 519,352,000 barrels in 1937. Gasoline exports ended the year at the highest level since 1930, exports and shipments for December totaling 5,423,000 barrels, and for the year, 50,198,000 barrels, or 31 percent above 1937. The high level of demand was reflected in gasoline stocks, which increased only 2,145,000 barrels in December; this was the smallest December increase recorded since the first comparable statistics (1934). On December 31, 1938, stocks of finished gasoline amounted to 65,949,000 barrels, compared with 69,892,000 barrels the previous year. Unfinished gasoline stocks were 5,731,000 barrels against 7,098,000 barrels, but natural gasoline stocks increased slightly—from 4,758,000 barrels December 31, 1937, to 4,830,000 barrels December 31, 1938.

"The increase in demand for heavy fuel oil continued encouraging, the December domestic demands (29,787,000 barrels) being 8 percent above a year ago. However, the total for 1938 (292,650,000 barrels) was 10 percent below that of 1937. The demand for kerosene increased slightly in 1938, but that of gas oil and distillate fuels, after running neck and neck with 1937, failed to establish a new record."

According to the Bureau of Labor Statistics, the price index for petroleum products in December was 50.9, compared with 59.5 in December, 1937. The index for the year was 55.9 compared with 60.5 for 1937. The operating ratio for December, on the basis of a crude oil capacity represented in the report of 4,118,000 barrels, was 77 percent compared with 79 percent in November and 78 percent in December, 1937.

Details of supply and demand for December, in thousands of barrels, and, in parentheses, for 1938, were as follows:

New Supply: Domestic production; crude, 102,287 (1,213,254); daily average, 3300 (3324); natural gasoline, 4345 (50,317); benzol, 186 (1699); total production, 106,818 (1,265,270); daily average, 3446 (3466).

Imports: Crude in bond, 444 (3651); for domestic use, 2416 (22,761); refined in bond, 1871 (20,349); for domestic use, 635 (7387).

Total new supply, all oils, 112,184 (1,319,418); daily average, 3619 (3615); decrease in stocks, all oils, 7771 (8723).

Demand: Total, 119,955 (1,328,141); daily average, 3870 (3639); exports, crude, 4884 (77,273); refined, 11,237 (116,633); domestic demand: Motor fuel, 41,649 (521,657); kerosene, 6813 (56,351); gas oil and distillate fuels, 15,656 (116,564); residual fuel oils, 29,787 (292,650); lubricants, 1831 (21,248); wax 61 (994); coke, 506 (5589); asphalt, 1132 (24,531); road oil, 174 (7775); still gas, 4933 (62,410); miscellaneous, 145 (1776); losses, 1147 (22,690). Total domestic demand, 103,834 (1,134,235); daily average, 3349 (3107).

Stocks: Crude, refinable in United States, 274,353; heavy in California, 16,467; natural gasoline, 4830; refined products, 259,613. Total, all oils, 555,263; days' supply, 143.

PAUL M. BENNETT, Z. W. Hook and others have organized a Delaware corporation, the American Exploration & Development Company, for the exploitation of natural resources. The administrative office is located at Manhattan, Kansas.

Burdette Blue heads new I. P. A. Committee

Personnel of the Committee on Petroleum Research of the Independent Petroleum Association of America was announced last week by Charles F. Roeser, Fort Worth, president of the association.

This committee is the successor to the Public Relations Committee and Burdette Blue, president of Indian Territory Illuminating Oil Company, Bartlesville, Oklahoma, is chairman. Blue was chairman of the predecessor committee for two years. Frank M. Porter, vice president of Wirt Franklin Petroleum Corporation, Oklahoma City, is vice chairman. Other committee members are:

R. C. Jopling, vice president, Phillips Petroleum Company, Bartlesville; Harry Leonard of Harry Leonard, Inc., Roswell, N. M.; R. J. Daugherty, The Empire Companies, Bartlesville; T. C. Johnson, Wichita, Kansas; Charles A. Warner, Houston Oil Company of Texas, Houston; C. A. Johnson, president, Holly Oil Company, Los Angeles; J. S. Noland, Barnsdall Oil Company, Tulsa; Frank Long, vice president, Oklahoma Natural Gas Company, Tulsa; Jake L. Hamon, Cox & Hamon, Dallas, Texas, and John W. Naylor, Fort Worth Star-Telegram, Fort Worth, Texas.

Arkansas royalty owners organize association

To "assure proper development of our oil fields" the Land and Royalty Association of Columbia County was organized in Magnolia, Arkansas, last week under the sponsorship of the Magnolia Chamber of Commerce. All operators, "big as well as little" will be assured protection, it was said.

Among the officers elected were R. T. Dudley, oil operator, president, and G. G. Martel, secretary.

Pipe Line News

[*Continued from page 61*]

is possible that it is Southern Minerals Corporation. This concern had been the crude buyer in the field until recently, loading crude at railroad siding and shipping it to Corpus Christi.

The third line is a 20-mile 3-inch main to carry gasoline from the Luby field, Nueces County, to Corpus Christi, the line to be built for Stanolind Oil & Gas Company. This company is constructing a 11,000,000-cubic-foot natural gasoline plant in the Luby field to process gas now being popped into the air.

The plant will process about 35,000 gallons of gasoline per day, it is estimated.

A short gas line will be built from Southern Minerals Corporation's natural gasoline plant in the Saxet field, Nueces County, to Columbian Carbon Company's plant now under construction in Section 421, near the town of Viola and in the Saxet field. The plant is to be completed in the near future and will consume about 25,000,000 cubic feet of residue gas from the natural gasoline plant.

WEEK'S DRILLING HIGHLIGHTS

California

A test at the foot of the Grapevine successfully drilled through a stratum of hard basalt which previously had discouraged operators in that section. Likewise in Kern County, a wildcat having reached 11,506 feet is reported preparing to set casing for a production test.

Texas Gulf Coast

Wilcox possibilities at Ace, Polk County, will get a showdown as soon as cement sets around casing landed at 7788 feet. Cap rock oil logged at Moss Bluff, Liberty County, will be tested soon. Old Ocean, Brazoria County, was defined on the north when a well was abandoned at 10,500 feet.

South Louisiana

Although continuing drilling, a Bastian Bay wildcat which cored a second oil sand during the week is looked upon as a field opener for Plaquemines Parish. In the same parish a new sand at Lake Hermitage yielded commercial production. Oil sand logged near 9681 feet is to be tested in a La Pice prospect wildcat in St. James Parish. Another new sand at 7800 feet on the southwest side of West Hackberry, Cameron Parish, contributed a 300-barrel well.

New Mexico

The Eunice townsite sector of Hardy was extended a half mile east, while South Eunice was extended the same distance south. An offset to an old failure near the intersection of the Langlie and Mattix fields is showing for a producer.

South Texas

Riverside field, Nueces County, was put into the class of crude producers by a 5000-foot completion and was extended 8500 feet southwest by two others. Jim Wells County reported opening of a 6500-foot pool 9 miles north of Alice and a 6200-foot Vicksburg sand pool 2 miles east of East Alice, in addition to a 6000-foot southwest outpost for East Premont coming in as a distillate well. Possibility of a large drilling campaign was indicated by discovery of a field at 5800 feet on trend with and 3 miles southwest of Tomoconnor. A wildcat on Gyp Hill prospect, 2 miles south of Falfurias in Brooks County, may produce from a 6800 foot sand being tested. Two wells extended East White Point field, San Patricio County, 9000 feet west. Hockleyensis sand contributed a new field to Live Oak County when a well near Ezzell pumped 50 barrels from 1300 feet.

Michigan

The first test of Monroe lime in Monitor township, Bay County, flowed and swabbed 178 barrels from about 3550 feet. The recent strike in Walker township of Kent County is causing some drilling.

West Texas

Saturated lime logged at 4972 feet indicated a 1½-mile northeast extension for Slaughter field, Hockley County. Completion of a 1¼-mile west expansion for North Cowden, Ector County, was delayed by a decision to take in more pay. The first failure was recorded for the west flank of Goldsmith field.

North Texas

A Clay County wildcat logged an oil show above the Strawn; 15 feet of Strawn saturation failed to make a producer in the offset to the discovery well of Best pool, Cooke County.

Kansas

Three Barton County wildcats gave encouragement of opening new fields. Morel pool, Graham County, appears to have a mile southeast extension in prospect.

Oklahoma

Ramsey pool got its first oil production outside of the community block on which all previous producers have been brought in. An outpost of Noble field, Cleveland County, and an offset to the discovery of Hillsdale, Garfield County, were failures. Dolomite production on the north side of Grayson was defined.

Comparison of Permits Granted for New Wells

STATE	Week Ending Feb. 11	Total this Mo.	Total this Year	Total this Date Last Year	1938 Year Total
Arkansas	....	19	19	35	247
California	19	34	135	155	1,146
Louisiana	22	63	129	164	1,214
Kansas	27	44	159	229	1,453
Michigan	16	39	102	63	953
Oklahoma	38	76	235	253	1,978
Texas	202	460	1,143	1,693	12,369
Total	324	735	1,922	2,592	19,360

Summary of Wells Completed in the United States Week Ending February 11, 1939

STATE	Completions	Oil Wells	Gas Wells	Failures	Initial Production	Total 1939	Total this Date 1938
Alabama	.....	.....	.....	.....	.....	1	.....
Arkansas	2	1	.....	1	450	34	29
California	18	15	.....	3	9,822	126	154
Colorado	.....	.....	.....	.....	.....	2	2
Florida	.....	.....	.....	.....	.....	.....	.....
Illinois	91	67	2	22	15,582	443	94
Indiana	.....	.....	.....	.....	.....	11	12
Kansas	24	16	.....	8	23,139	150	267
Kentucky	11	6	1	4	663	100	89
Louisiana	21	14	2	5	4,976	112	155
Michigan	26	13	1	12	4,590	133	108
Mississippi	.....	.....	.....	.....	.....	1	2
Montana	3	3	.....	.....	189	14	6
Nebraska	.....	.....	.....	.....	.....	.....	.....
New Mexico	16	12	2	2	9,393	88	67
New York	*10	8	1	1	48	*68	*84
Ohio	19	4	6	9	60	115	137
Oklahoma	31	14	1	16	2,376	233	294
Pennsylvania	*22	15	4	3	19	*163	*266
Texas	207	157	8	42	184,502	1,287	1,616
Utah	.....	.....	.....	.....	.....	.....	.....
West Virginia	7	1	6	.....	100	67	130
Wyoming	3	2	1	.....	4	30	10
Total this week	511	348	35	128	255,913	3,178	3,522
Total last week	513	330	39	144	229,175	.....	.....
Total this year	3,178	2,152	248	778	.....	.....	.....

* Includes water-intake and pressure wells.

Oklahoma Fields

Ramsey gets first oil outside community block.
Noble and Hillsdale attempts fail to get production.

Tulsa.—First production outside of the community block of the Ramsey pool, Payne County, came last week with completion of Walters 1, SWc NE 18-18n-2e, from Wilcox sand total depth 4238 feet. Stanolind Oil & Gas Company and associates had two hourly gauges, one for 120 barrels, the other for 150 barrels, before shutting the well in to be tested for potential later.

Two Oklahoma discoveries of 1938 had discouraging reports. More than a mile east of the one producer in the Noble field, Cleveland County, failure was marked up in Alberts 1, SE SW NW 19-7n-1w, which went to 7734 feet. The north offset to the discovery well in the Hillsdale field, Garfield County, has failed to get production but has not been abandoned.

Two wildcats were started during the week, one in the Newalla area of Oklahoma County, where structural conditions are attractive despite three failures in the past. The northern part of Kingfisher County drew a test.

Limit of production for the north extension of Grayson dolomite production was established by a failure, which was plugged back to get oil from Earlsboro sand. The deepening of a well in the north end of the Fish pool, Seminole and Hughes County, to get flowing production from the Simpson dolomite leaves the possibility of this area coming into favor as one for reworking old wells.

Present favorite spot for development in an old field is the St. Louis field, Pottawatomie County. This county last week drew 13 of the 38 wells started in Oklahoma.

Completion of the first well outside the community block in the Ramsey pool, Payne County, gives encouragement that this field will cover at least 400 acres when fully developed. On that basis it has another 20 wells to be drilled, as 19 wells flowing, one in process of completion and one drilling.

The extension well, drilled by Stanolind Oil & Gas Company, Walters 1, SWc NE 18-18n-2e, began flowing after washing in from Wilcox sand, top 4809 feet, total depth 4823 feet. It is two locations east of production. The fact that this well ran low on all markers gives an indication that production will not extend much farther in this direction.

Within the community block production was extended one location to the north earlier in the week with the completion of Ramsey 7, NW SE NW 18-18n-2e, which established potential of 7716 barrels from Wilcox sand, top 4733 feet, total depth 4667 feet. This well was drilled by Mid-Continent Petroleum Corporation, which has charge of all development on the community block of 640 acres.

Another well within the community block, Brandon 4, NW SE NW 13-18n-2e, was ready for completion, with casing set at 4766 feet. The other drilling well in the field is Brandon 4, also within the community block, NW SE NE 13-18n-2e, active in the field is Ramsey 8, NE NW NW 18-18n-2e, drilling below 3600 feet.

All producers in the Ramsey field are flowing and under voluntary restriction, around 150 barrels daily per well. Although the field, discovered early in 1938, is expected to be small in area, thickness of the sand body, 40 feet, plus the program of flowing wells to get full advantage of reservoir energy indicate high ultimate yield.

The week brought further discouragement for the Hillsdale field, Garfield County. The northwest offset to the discovery well has failed so far to get saturation in the Second Wilcox sand. It is Boehm 2, NE SE NW 4-24n-8w, which Camplin Refining Company has carried to 6732 feet. The south offset to the discovery well, Mackey 1, NW NW SE 4-24n-8w, is making 100 barrels of clean oil daily from Second Wilcox sand, total depth 6703 feet. The discovery well, Boehm 1, SWc NE 4-24n-8w, was completed in November from Second Wilcox sand, total depth 6702 feet. Its flowing output, around 150 barrels daily is accompanied by as much as 200 barrels of water.

South of the Hillsdale discovery Champlin Refining Company shortly will be ready to test Allen 1, SEc 26-24n-8w. Casing has been set at 6240 feet, total depth 6388 feet. It is five miles southeast of the discovery well.

A failure two miles southeast of the discovery well at Noble, Cleveland County, left extension for that area in doubt. Burke-Greis Oil Company drilled Alberts 1, SE SW NW 19-7n-1w, to 7734 feet in the Simpson series. It ran low in comparison with the discovery well and had no oil shows in any formation.

The discovery well, Burgher 1, SE SW 12-7n-2w, was completed in May, 1938, by W. A. Delaney in Second Wilcox sand, at 7663 feet. It was drilled to 7682 feet and plugged back. It flowed for a short time but began making water. For several months it has been producing around 150 barrels daily by submersible pump. Water output is higher than the oil. North of the producing well Gulf Oil Corporation drilled a dry hole, Taylor 1, SE SE SW 1-7n-2w, to 6908 feet, where it proved dry in the two Wilcox sands. It was plugged back for several tests of other formations and finally abandoned.

Earlsboro Sand in Grayson Extension

Production from the Earlsboro sand was established for the north extension of the Grayson pool, Seminole County, by Sunray Oil Company, whose Fleet 1, NE SW SW 12-6n-5e, was dry in both the dolomite and the Wilcox sand. It was plugged back to 2900 feet with casing set at 2842 feet and shot with 15 quarts. On swabbing tests it produced at the rate of 140 barrels and is estimated at 200 barrels daily on the pump.

This well marks a northeast southwest limit for the area as the well proved existence of a fault. This well is two locations west of the first well to get Wilcox sand production in the extension, Tiger 1, NE SW SE 12-6n-5e, drilled by Mid-Continent Petroleum Corporation.

First production in the extension area was from dolomite, which is expected to cover around 300 acres, while production from the Wilcox sand will be not more than half that area. Two wells area ready for completion in the dolomite. Superior Oil Corporation's Bates 1, NE NW NE 13-6n-5e, on preliminary tests pumped 300 barrels of oil and 30 barrels of water, total depth 3828 feet. Its Weldon 1, NEc 13-6n-5e, is rigging up to pump from dolomite, total depth 3828 feet, with no water showing.

The possibility of reworking wells in the old Fish pool, Hughes and Seminole counties, came with the finding of production in Simpson dolomite

OKLAHOMA
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Caddo—		
Magnolia, Henley 2, sw nec se 35-6n-10w	2¶	4760
Carter—		
Dillingham et al, Harrell 1A, ne nwc ne 22-2s-2w	8	833
Comanche—		
Gandy, Fee 1, nw nwc 2-1n-11w	*	431
S. S. Oil Corp., School Land 1, sw se sw 20-2n-10w (pb 989 ft)	*	1495
Creek—		
Mazda Oil Co., McAdams 1, ne nw se 36-17n-9e	*	3101
Garfield—		
Jones Oil Co., Wolf 1, se sw nw 13-22n-4w	*	4626
Hughes—		
McGee, Lucas 3, ne sw sw 1-9n-10e	*	1200
Lincoln—		
Wilcox O&G Co., Licon 1, nw sw sw 11-14n-6e	57	2971
Sac & Fox 21, nw sw nw 15-14n-6e	288	3028
Muskogee—		
Adkins' Eubank 2A, se ne se se 14-14n-16e	*	1540
Beard, Lewis 1A, c e½ sw sw 32-14n-16e	5	2171
Oklahoma—		
Canadian Pet. Co., Graham 1-A, swc ne 2-11n-3w	*	4247
Pontotoc—		
J. Casey, Pace 1, swc ne 14-2n-7e	*	1614
Senora O&G Co., Burk 1, swc se 25-5n-4e	30	2560
Pottawatomie—		
Denver P&R Co., Hillerman 1, nwc sw 1-6n-4e	*	4216
Richards 1, sw ne ne 2-6n-4e (otd 4092 ft)	260	4111
Racott Oil Co., Kernn 1, swc nw 5-6n-4e (pb 4310 ft)	*	4624
Denver P&R Co., Smith 1, nec nw 6-6n-5e (otd 4466 ft)	110	4213
Associated Dr Co., Brown 1, sw sw nw 14-7n-4e	56	4218
Magnolia, Brister 2, nw sw ne 28-7n-4e (pb 3112 ft)	*	4150
Shell, Youts 1, nwc sw 28-7n-5e (pb 2880 ft)	*	4351
Vierson, Palmer 1, sec nw 32-7n-5e	250	4054
Rhodd 2, nw ne sw 32-7n-5e	585	4049
Seminole—		
Superior, Tiger 2, sw se se 12-6n-5e	105	3805
Hall, Troup & Moore, Brinlee 1A, 100 ft n swc ne 27-6n-5e (otd 2324 ft)	*	2770
Rogers & Rogers, Stockton 2, 160 ft w nw se sw 25-7n-5e	178	2963
Swan 1, swc ne 36-7n-5e	*	4540
Rogers O&G Co., Oaks 1, swc 16-7n-6e (otd 4447 ft)	289	4433
Cities Service, Gross 1, nwc se 25-9n-6e (pb 4184 ft)	154	4228
Horwitz-Jones, Harris 1, 100 ft n se nw nw 22-10n-7e	*	3581
Stephens—		
McAllister & Lewis, Parrott & Trout 1, se nw sw 1-2s-8w	*	1513

* Failures; † Junked; ¶ Million cu. ft. gas.

by Eason Oil Company's Fish 1, 19-7n-8e, the north end of the pool. The well was completed in 1930 in Wapanucka lime. It was drilled deeper and picked up the dolomite at 4070 feet and drilled to 4092 feet, where it began flowing through tubing at 45 barrels an hour.

Two wildcats were among the list of wells started in Oklahoma last week. The Newalla area of Oklahoma County, got a location by R. Olsen Oil Company, White 1, C NE NE 30-11n-1e. This area has been worked several times by geology and geophysics and three dry holes have been drilled.

Kingfisher County drew another wildcat test by Kenneth Ellison, whose Baker 1, NEc SW 20-19n-5w, will be drilled to the Wilcox sand. It is in the north part of the county and 15 miles from the other active Kingfisher County wildcat of Trigg, Carr and Gutowsky, Lankard 1, NEc SE 24-17n-1w, which is now below 5500 feet.

East of the Doyle pool, Stephens County, Phillips Petroleum Company has shut down the wildcat, Culbertson 1, NWc SE 4-1n-5w, which is at 4347 feet.

The Carter County wildcat of Pure Oil Company, Noble 1, C NE SE 35-2s-1e, is in Viola lime, top 5014 feet.

Another test for the Stockton area, Love County, is ready to start with Sinclair Prairie Oil Company building roads for Stockton 2, NEc SW 26-6n-2w. It is a quarter of a mile northeast of the one producing well, Stockton 1, SEc SW 26-6n-2w, which is producing from 6930 feet, after plugging back from 8775 feet. The well has been flowing 30 barrels daily for more than a year.

Drilling should be resumed this month in the deep test for Washita County, western Oklahoma, where Continental Oil Company is under-reaming below 9500 feet in Procter 1, C NW 28-10n-20w. The hole is at 10,195 feet and 9-inch casing will be set.

First Forest City Basin test starts in Kansas

St. Joseph, Mo.—The first drilling well for the Forest City basin play, went to Leavenworth County, Kansas, but two tests are due for early starting in Missouri, which drew the first inrush of leasing. In Leavenworth County, John Hardway and associates have a machine test going at Schiller 1, SW SE SW 30-10-22e, six miles west of the Bonner Springs gas field and seven miles north of the Linwood gas field. Surface pipe has been set at 225 feet.

A location announced last week will bring a test for Macon County, Missouri. C. E. Richardson is making contract for a rotary test for Jones 1, C NW NW 16-58-17, Macon County. A block of 6000 acres has been assembled. The plan is to drill 4000 feet.

A deal is under way whereby the Northern Missouri Oil Development Company will take over the drilling of the first well on acreage assembled by H. V. Elwell. The concern is now selling stock. Elwell, one of the first men to assemble leases in the Missouri part of the basin, has cable took derrick standing for Taylor 1, C EL NW 12-62n-10e, for several weeks. This is due to be one of the first wells started by the new company. It will get an interest in this well and one other and will get a half interest in 20 acres in seven counties.

Kansas Field Developments

Completions and new locations register increases. Morel extension looms; Barton County test shows.

Wichita.— Field activity in Kansas was written with higher figures last week. Wells started numbered 27 while completions numbered 24. The figures are similar to those for the last months of 1938, the period when field work in Kansas was leveling off from the peak for the first half of the year. During January totals for Kansas field activity held well below the average mark for the final half of 1938.

The southeast extension for Morel field, Graham County, was close to completion with oil standing 2700 feet in the hole after acid treatment.

Barton County had a wildcat showing for production after several weeks of testing and drilling deeper. Two other wildcats in this county had showings to justify setting casing for tests.

The new pool for Barton County looked promising after pumping ouput of 200 barrels daily came from the wildcat of Long & Johnson's Eveleigh 1, SWc NE 3-18-14w. It has been showing oil for several weeks while drilling cautiously. The hole was at 3369 feet in Arbuckle lime for the pumping test.

The mile extension to the southeast for the one-well Morel pool, Graham County, seemed assured last week when oil rose 2700 feet in the hole after acid treatment. The test by Continental Oil Company, Drumm 1, SEc NE 16-19-21w, was drilled to 3702 feet in Arbuckle lime. It filled 700 feet with oil before acid treatment. After 1000 gallons of acid had been used the oil column rose to 2700 feet in 16 hours. The well will have a pumping test to determine potential.

The Morel pool has but one well. Oil in the extension tested 27.3 gravity, similar to the oil from the producing well.

Northwest of the West Ellinwood field, Barton County, Gulf Oil Corporation found saturated Arbuckle lime in a core between 3347 and 3352 feet. Pipe is being run for a test.

Another wildcat test to reach the Arbuckle lime was that of Virginia Drilling Company, whose Schalchtermeyer 1, SEc NW 7-21-11w, had a core showing only fair saturation between 3457 and 3463 feet. Top of the lime was at 3456 feet. It was shut down for orders.

Extension of the new Hagen pool, Barton County, to the southeast met discouragement with abandonment of Hagen 1, SEc NE 29-20-11w, total depth 3552 feet. It was a half mile southeast of production.

A Cowley County wildcat, five miles east of the Burden pool, Snodgrass 1, NEc SE 36-30-6e, was abandoned by Barnsdall Oil Company at 3000 feet in the Mississippi lime.

KANSAS
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Barton—		
Sinclair Prairie, Joe Prusa 1, nw sw se ne 20-16s-11w	1239	3305
Shell, Schneider 2B, nw ne nw 1-16s-14w (otd 3294 ft)	2248	3310
Skelly, Linsner 1, sw se se 3-17s-13w	*	3418
Gulf, Spanier 5, cwl sw ne nw 12-20n-11w	2209	3272
Butler—		
Polhamus, Clawson 1, se sw nw 7-24s-4e	*	2550
Cowley—		
Brewer et al, Miller 1, ne nw ne 13-32s-5e	*	3074
Smith-Pryor & Lockhart, Kingsbury "A" 1, nw ne nw 9-33s-6e	414	3512
Ellis—		
Murphy Oil Co., Rumsey 3, sw ne sw 23-11s-17w	3500	3395
Carlock, Phillips 1, se sw ne 10-15s-17w	*	3520
Greenwood—		
Shull Dr Co., Long 2, sec ne 17-23s-13e	*	1887
Katz Oil Co., Christy 6, ne sw se 12-26s-9e	*	2174
Pratt—		
Skelly, Miller 1, se ne nw nw 36-27s-11w	292	3500
Rice—		
Continental, Siemsen 2, sw nw nw 18-18s-2w	2609	3212
McNickle 7, nec sw 13-18s-8w	1230	3234
Cities Service et al, Dewitt 1, 110 ft n cwl sw se ne 33-19s-9w	1540	3195
Tatlock, Bayer "A" 2, sw nw ne 7-20s-10w	1038	3325
Rooks—		
Producers Oil Co., Ham 1, swc nw 27-7s-19w	*	3372
Krueger et al, Tatkenhorst 3, ne se sw 11-9s-16w	175	3241
Russell—		
Jones & Shelburne, Kuhnle 2, sw se nw 4-15s-12w	1205	3073
Cities Service, Ochs 3, swc ne 23-15s-14w	1533	3358
Stafford—		
J. E. Crosbie, Nickle 1, c s½ se se 2-24s-11w	*	3718
E. H. Moore, Inc., Cleo Johnson 9, nw ne se 13-24s-11w	1614	3813
Stanolind, Volker "B" 5, swc 14-24s-11w	271	3809
Continental et al, McCune 1, swc ne 12-25s-13w	2022	4091

* Failures; † Junked; ¶ Million cu. ft. gas.

Ten-acre spacing favored for Pecos Valley field

Ten-acre spacing for the Pecos Valley field was advocated last week at a hearing before the Texas Railroad Commission. The only opposition to the plan came from representatives of operators who are producing in the river bed.

Union Oil & Mining Company had requested that the field be divided, and a North Pecos Valley field set out. Company officials explained that wells in this section produce 34 to 40 gravity oil, a grade about 10 degrees higher than that produced in the old Pecos Valley field.

Comanche Pipe Line Company has offered to purchase 500 barrels a day more from the high-gravity area.

Commissioner Ernest O. Thompson indicated that he favored such a plan, provided all high-gravity wells were included in the increase.

Thompson said he thought a proration order based on half acreage and half per-well would be reasonable, and indicated that he would recommend such a plan to the commission.

Illinois Developments

Wayne County wildcat flows 70 barrels hour from McClosky. Hope for cold weather that will harden boggy field roads.

Olney, Ill.—Carl Robinson's D. K. Felix 1, SW SE SE 27-2s-8e, Barnhill township, Wayne County, started at 70 barrels an hour last week when plugs were drilled to the 18-foot McClosky saturation. It maintained that production rate for 8 hours, when it was shut in for lack of additional storage. The wildcat, which encountered the McClosky pay a week ago, is 4 miles southeast of Fairfield. It topped the pay at 3390 and was bottomed at 3410 feet.

Farther north in the basin, J. J. Menhall Corporation's I.C. R.R. 1, SW NE NW 8-2n-1e, Sandoval township, was drilling at 2800 feet and was closely watched. It is expected to confirm the Niagaran lime pool opened late last year by Southwestern Oil & Gas Company's Benoist 21, NW NW NE 8-2n-1e, less than 1 mile east of the Menhall well. Formations at the two wells were reported running even, indicating the second well will have but a short distance to go.

Shut down most of the time since last December, the southwestern Company's discovery last week was connected with the Illinois Pipe Line Company's system and started delivering 20 barrels daily. The well is capable of pumping about 150 barrels daily.

A cable tool outfit was to be moved to Max Pray's J. Langenfeld 1, NW SW NW 4-2n-1e, north of the discovery, in an effort to make it a producer. The Langenfeld cored a 24-foot Niagaran lime saturation, but had sulphur water when plugs were drilled.

After finding water in the McClosky on drilling plugs to a 10-foot lime saturation, Chicago Syndicate's Williams 1, NW NE SE 36-1n-2e, Raccoon township, Marion County, was still attempting to make a well in the Rosiclare sand.

The hole has been plugged back to 2405 feet from the McClosky at 2435-48 feet. The crew was swabbing, but water was still causing difficulties. The wildcat is 13 miles southeast of Centralia.

Extremely muddy fields, by far the worst encountered since the current boom started in 1936, retarded operations in most sections of the basin. At many locations, inability to move fuel to boilers brought a shut-down of routine drilling operations, and other tests were stopped by needed materials. In a few instances, the threat of flood waters made it advisable to shut in producing wells as well as to shut down drilling wells.

The horse, and not always the saddle variety, replaced automobiles and trucks as the preferred transportation method. Field workers unused to riding, and those forced to employ field work and team horses were not handicapped, as progress was slow and laborious regardless of the rider's ability or the mount.

A cold wave that moved in from the northwest late in the week, however, promised to retard the rise of streams and rivers and lessen the danger to wells drilling in the low lands. Operators were hoping the sub-freezing weather would last long enough to harden the ground and permit movement of equipment and trucks to well locations.

G. H. Blankenship and Pres Cochrane's Oak Grove Cemetery 1, Section 15-3n-3w, 1½ miles southwest of G. H. Blankenship's J. L. Dennis 1, pool opener in Pilot Knob Township, Washington County, had surface pipe set last week. The well will be closely watched as indicating the value of the Benoist sand pool opener which started at about 200 barrels daily. If successfully completed, it will force offsets by Shell Petroleum Corporation and Magnolia Petroleum Company.

In the same area, Hutchins' Weihe 1, SW SE 35-2s-3w, Nashville Township, 2 miles south of Nashville and 3½ miles north of the Dennis pool opener, shut down after setting surface pipe pending results of a seismograph test of the area by Adams Oil & Gas Company.

At a location 100 yards from a test drilled several months ago that found an oil show in the Petro sand, Frank Pitchford's Hafer 1, NW 27-1s-1w, 2 miles west and south of Irvington, was drilling at 500 feet. Operators hope to make a small well in the Petro, expected at 730 feet. The first test of the area, by Pashall-Graham Oil Company, was abandoned after being taken to deeper formations.

Abandoned at 3102 feet for several months, Adams Oil & Gas Company's Old Ben Coal Company 1, SW SW NE 19-5s-2e, Barren Township, Franklin County, 10 miles north of Benton, was reported preparing to resume for a test

OHIO

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Athens County—		
A. D. Townsend, J. Niggermeyer 6	¶.40	1727
Ball & Co., Finsterwald 1	*	1868
Belmont County—		
Patterson & Clymer, Ackerman 1	*	1345
Coshocton County—		
Kundtz-Hulse, Inc. et al, Wilt 2	¶.05	3097
Robinson et al, Carl 1	30	3097
Cuyahoga County—		
Benedum-Trees, Curry 1	20	2855
Guernsey County—		
Jewell, Harding 1	*	1256
Knox County—		
Perkins Gas Co., Perkins 1	*	2454
Licking County—		
Midland Oil Co., Orr 2	¶.28	3035
Patten et al (St. Athens Drilling Co.), Wright 2	5	780
Hoover Bros., Hoover 1	*	652
Emerald Petroleum Co., Frey 2	*	2994
Monroe County—		
Jim Run Oil & Gas Co., Tuel 1	¶	2303
Morgan County—		
McCoy et al, Ellis 1	*	727
Muskingum County—		
Forsyth, Sprague 1	5	964
Noble County—		
Permian Oil & Gas Co., Blake 7		1715
Perry County—		
Ohio Fuel Gas Co., Jones 2	¶.80	3778
Brinegar, Burkhart 1	*	1727
Seneca County—		
Sun Oil Co., Crum 2	*	2221
Washington County—		
Hall et al, Freimer 3	¶.25	1300

* Failures; † Junked; ¶ Million cu. ft. gas.

ILLINOIS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Clay County—		
Pure Oil Co., R. H. Pierce 1	432	3075
Nellie V. Bunn 6	777	3095
Joseph Ullom 5	398	3055
Clinton County—		
Newton & Ward, Trame 2	35	1008
Watkins & Wright, W. F. Weihe 1	*	1360
Adams Oil & Gas Co., Copple 7	50	1369
H. H. Weinert, Buehler 3	75	1367
A. C. Thomas et al, Holthaus 1	*	1355
Pass et al, Frank Erlingler 1	*	1370
Lou Huddleston et al, W. A. Allen 1	*	1389
Coles County—		
Kingwood Oil Co., Tiven 1	*	3399
Crawford County—		
Salvage Oil & Gas Co., M. S. McGrillis 6	*	2785
Cumberland County—		
O. J. Marshall, Baker 1	*	2485
Effingham County—		
Gassman et al, William Wagner 1	*	2690
Fayette County—		
Mylius et al, Fezel 1	*	2001
Magnolia Petroleum Corp., T. C. Clow 18	949	1594
T. C. Clow 20	960	1531
Carter Oil Co., Irvin Hobbs 4	156	1585
Edith Quade 2	180	1499
Edith Quade 3	240	1570
Mabel Durbin 1	72	1524
Ola Martin 1	172	1584
Edwin E. Shelton 1	240	1573
Ola Harper 4	67	1540
Florence Harding 2	110	1540
Florence Harding 3	179	1553
Emma McCormick 3	48	1544
Emma McCormick 4	100	1588
Orin Sidener 2	234	1570
F. W. Coddington 1	488	1532
Jarvis Bros., Yakey 6	200	1513
Yakey 7	150	1581
Yakey 8	150	1519
Homan 4C	160	1568
Homan 1B	130	1584
Kingwood-Duncan, Yolton 10	163	1544
W. C. McBride, Inc., Logue 3	204	1579
Sommers & Egan, Owens 1	350	1529
C. F. Steele, Arnold 2	100	1473
Dixie Oil Co., Arnold 2B	380	1549
Arnold 3B	250	1535
Arnold 5B	250	1578
Niagra Oil Co., L. E. Wilson 1	70	1605
Texas Co., Philbrook 2	100	1561
Philbrook 5	150	1562
Jefferson County—		
A. S. Walker, Pace Heirs 1	*	2579
Minerva Oil Co., Warren 1	*	2808
Lawrence County—		
Kentucky Natural Gas, Carpenter et al 1	¶15.0	1100
Kesl et al, Scott Gray 2	¶21.5	1080
Madison County—		
Penn-Ill. Development Co., Keller 1	*	400
Marion County—		
Rockhill Oil Co., Foster 10	985	2060
Texas Co., R. Fyke 3	295	1854
R. Fyke 4	160	1864
R. Fyke 5	150	1879
E. Snyder 1	80	1915
E. Jett 1	175	1865
E. Jett 2	250	1851
E. Jett 3	165	1866
D. Young 4	45	1830
D. Young 5	54	1819
D. Young 7	200	1849
D. Young 8	45	1861
D. Young 9	50	1853
C. Kleinschmidt 2	200	1872
C. Kleinschmidt 3	200	1868
F. Lee 3	80	1780
N. Lee 6	55	1778
N. Lee 7	50	1753
Magnolia Petroleum Corp., C. D. Phillips 2	195	1850
C. D. Phillips 3	216	1865
C. D. Phillips 4	168	1880
W. O. Chitwood 16	240	1842
Max Pray, A. M. Cole 1	179	1865
Southwestern O&G Co., Benoist 21	319	2926
Ed Hollmans et al, Shanafelt School 1	*	2261
Vermilion Oil Co., J. F. Ryan 1	*	2151
J. D. Laine, Dempsey 3	426	1771
Wiser Oil Co., Weems 7	400	2044
Helmerick & Payne, P. O. Anderson 1	288	2104
Randolph County—		
Leon Beattie et al, Smiley 1	*	1251
Richland County—		
Pyramid Petroleum Co., Beck & Stivers 1	*	3074
Texas Co., C. Winters 2	*	3128
Wabash County—		
Guilde & Jones, W. Chapman 1	*	3500
Wayne County—		
H. H. Weinert, Morlan 5C	400	3336
Texas Co., J. Gernon 2	*	3429
O. Gregory 1	*	3334
T. W. Eason, Twist 2	*	3397
New Penn Development Corp., J. L. Wagner 1	240	3445
Rockhill Oil Co., Twist 1C	450	3368
Twist 4B	53	3343
White County—		
Pyramid Petroleum Corp., Gilbert Wode 1	*	3000

* Failures; † Junked; ¶ Million cu. ft. gas.

of the Devonian. This wildcat had topped the St. Louis lime at 2960 feet.

In the Richland County Cypress sand area on the Noble-Decker Township line, Pure Oil Company's F. Wakefield 6, 26-4n-9e, set casing to 3050 feet. The well swabbed and made a flow from the McClosky before the casing seat failed, apparently indicating both McClosky lime and Cypress sand pay in this area. The Cypress did not contain a worthwhile saturation, although other wells on the lease are producing from that saturation.

Bert Fields et al's Green 1, SW SW SW 16-9s-9e, Gallatin County wildcat in southeastern Illinois, was drilling at 2350 feet to try for production in the McClosky zone due near the 2650-foot level before attempting a completion in a shallower oil pay. Green 1 logged adequate oil saturation in the Waltersburg at 1767-1803 feet to make a producer, according to reports. The supporting lease block centers about 3½ miles northwest of Shawneetown.

Purchase of 70 acres and 5 producing wells by The Texas Company from Kingwood Oil Company of Effingham last week was followed by sharp curtailment of output on these and adjoining properties in the Salem pool, Marion County. Well output was reduced to 50 barrels daily and adjoining lease owners also reduced well output. The transaction involved N½ SE NE Section 31-2n-2e with 2 Bethel sand wells and 1 McClosky lime well; one tract of 40 acres NE SE Section 30-2n-2e with 1 Bethel sand well; one 10-acre tract in SEc Section 29-2n-2e, on which is 1 McClosky lime well.

Kingwood Oil Company, which formerly had headquarters at Okmulgee, retains other producing leases in Salem as well as in other fields in the Illinois basin.

Illinois output may reach 50 million

Dr. A. H. Bell, chief of the oil and gas division of the Illinois Geological Survey, predicted that Illinois oil production may soar to an all-time high of 50,000,000 barrels this year, more than double the 1938 output, if unforeseen obstacles do not arise. Bell spoke before the Illinois Society of Engineers convention held in Springfield.

"In 1938, we saw production increase to the unexpected total of 23,500,000 barrels," Dr. Bell said. "On the basis of deep drilling tests and other data now available, it is safe to assume the 1939 total will be more than double this amount. There are unforeseen circumstances, of course, that may retard development, but at the present time exploration is proceeding without hindrance in all fields."

WEST VIRGINIA
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Cabel County—		
Vesta Drilling Co., Childers 1	¶	3275
Gilmer County—		
Pittsburgh & West Virginia Gas Co., Simmons 2	¶60	1860
Jackson County—		
Godfrey L. Cabot, Inc., Walker & Jones 1	¶	5137
Kanawha County—		
Spartan Gas Co., Fisher et al 2	¶15.84	5116
Lincoln County—		
Woodall Gas Co., Plumley 1	¶.32	1554
Pleasants County—		
Schultz Oil Co., Hammett 4	100	1920
Wetzel County—		
Big Four Oil & Gas Trust, Herrick 1	¶.15	600

* Failures; † Junked; ¶ Million cu. ft. gas.

Kentucky Fields

Major extension is assured for Spottsville pool. High water retards many operations in district.

Owensboro, Ky.—Maurice T. Grugg and Harry Fotiades' T. Cooksey 1 assured a 1½ mile north extension to the new Spottsville pool of Henderson County as 200 feet of oil stood in the 2240-foot hole last week before acid was dumped in. Completion of the McClosky lime test was delayed by a cave in of the Mississippi lime which made necessary setting of a new casing.

There was little production taken from the Birk City pool of Henderson and Daviess Counties as wells were capped and pumping machinery dismantled. Water covered the tops of many wells and blanked out drilling platforms as recent heavy rains brought a rapid rise of the Green and Ohio rivers.

At J. C. Ellis' K. A. Jones 2, in the Birk City pool, drillers placed a 20-foot pipe over the hole, where water was standing. Eleven wells on the Dempewolf farm were capped at the top, and similar action was being taken at the neighboring Blackwell, Boswell and other leases. In the horseshoe bend area, A. A. Douglass et al's J. Rankin 1, wildcat, moved all machinery before the water covered the location. A spudding outfit will be used in further attempts to make this well, which found the McClosky dry at 2471 feet, a producer.

W. H. Parks et al's O. G. Letcher 1, an indicated pool opener in the Scuffletown section of Henderson County, was capped, with water only a few feet away. Hardest hit by high water was Ralston & Sales' Annie Stewart Ferry 1, in the Spottsville section, which was covered by more than three feet of water. The test is on a location on the edge of the Green River, just outside of Spottsville.

Sun Oil Company and Kentucky Natural Gas Company's G. Trigg 2, wildcat in the Corydon section of Henderson County, made fair progress during the week, and at last report was drilling at 2300 feet. It is 1 mile east of a dry hole drilled last year.

In Webster County, Iley Browning's J. Sutton 1, a 600-foot east offset of this operator's J. R. Ramsey 1, pool opener of last fall, was drilling at 1100 feet with cable tools. It expected to reach the McClosky which was at 1396 feet at the discovery, within a week.

Joe A. Worsham's Pearl 1, near Olney, Hopkins County, reported a gas flow at 1416 feet estimated at 1,000,000 cubic feet a day. Seven miles west of Madisonville, same county, Gulf Refining Company's L. W. Schmetzer 1 was making fair progress toward the Devonian, expected at 4000 feet. It was drilling below 3300 feet at last report.

KENTUCKY
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Butler County—		
Ellison et al, Warren & Pendley 1	*	554
Daviess County—		
Daugherty & Ellis, Howard et al 2	*	1665
O. D. Vickers et al, Johnson 2	60	1460
Farmer et al, Brown 1	15	1384
Master Oil Co., Richmond 2	30	1191
McLean County—		
Phillips et al, Arnold 1	*	2200
W. K. Snyder et al, Lloyd-Jackson 1	*	1464
Martin County—		
Kentucky-West Virginia Gas Co., Ward 5249	¶.20	2546
Muhlenberg County—		
Fred Phillips, Shearn Coal Co. 1	150	1541
Powell County—		
Sparks, Weathers et al, Vanderpool 1	8	....

* Failures; † Junked; ¶ Million cu. ft. gas.

PENNSYLVANIA
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Beaver County—		
Hanley & Bird, S. Calvin 1	*	4862
Indiana County—		
Equitable Gas Co., Savings & Trust Co. 3244	*	3800
Potter County—		
Updegraph et al, Whitney 1	¶6.50	4902
Washington County—		
Keystone Drilling Co., Grego 1	¶.04	799
Bradford District		
Moore Oil & Gas Co., Moore Estate	1	....
T. H. Kervin, Jr., No. 5, Adams	¶	....
Adolph Schorman, fee	1	....
Forest Oil Corp.	1	....
Forest Petroleum Corp.	1	....
Niagara Oil Corp.	1	....
Bradford Transit Co., 6 wells	6	....
Bradford: Water Intake Well		
Forest Oil Corp.	...	....
Butler-Armstrong District		
Gallagher & Co., Adam Beyer	3	....
Middle District		
C. L. Irwin, Harriet & L. B. Cross	1	....
Anderson, Anderson	3½	....
New York-Pennsylvania: Gas Field		
G. L. Cabot, Inc., C. Crane No. 1	¶	....
Belmont Quadrangle Drilling Co., Treat	*	....

* Failures; † Junked; ¶ Million cu. ft. gas.

NEW YORK
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Steuben County—		
New York State Natural Gas Co., Boyd 1	¶14	3902
Van Gelder et al, Farnham 1	*	3886
Allegany County—		
H. W. Patterson, Clark farm, Scio	6	953
Harry Sackinger, Root farm, Bolivar	5	1250
Bradley Prod. Corp., Tullar farm, Alma	12	1390
Forest Oil Corp., Ackerman farm, Bolivar	13	1370
J. H. Reynolds, Sage farm, Bolivar	6	1246
Budd Oil Co., Anderson-Otis farm, Alma	6	1365
Allegany: Water Intake Wells		
H. N. & W. E. Sawyer, Cowles farm, Bolivar	...	1275
Porge Oil Co., Anderson-Otis farm, Alma	...	1371

* Failures; † Junked; ¶ Million cu. ft. gas.

Indiana

Operations slowed by heavy rains throughout district

Evansville, Ind.—In the vicinity of the Cooper Estate discovery well in Gibson County, Hollingsworth & Bander Drilling Company's Cooper Estate 1, 240 feet south, was drilling at 1800 feet. Continued operations throughout the last days of the week were threatened as ground conditions became worse. Locations were announced for Cooper Estate 2, 240 feet east of the drilling well, and for No. 3, 600 feet south of Cooper 2.

Ray Ryan and J. L. Smith's W. Dunn 1, NE SE SE 18-3s-13w, 1¼ miles east of the discovery and engaged in a drilling race with the Hollingsworth & Bander test for confirmation of the pool, was forced to shut down at about 1700 feet when gasoline trucks could no longer gain access to the location.

Work was at a standstill at many Southern Indiana locations, while at others drilling was continued despite difficulties in reaching locations.

W. W. Damron's Cora Niles 1, NE NW 2-8s-7w, two miles northeast of Enterprise and five miles southwest of Rockport, Spencer County, started drilling last week and at last report was below 300 feet.

Sun Oil Company's E. J. Schroeder 2, NE NE SE 1-7s-12w, was abandoned last week after finding the Waltersburg sand dry. The company suspended operations on the H. A. Hahn lease in the same section, which comprises part of the Heusler dome pool, until more favorable weather.

In Warrick County, Imperial Oil & Gas Products Company's Mabeth Mining Company 1, SE NW NW 12-6s-8w, Boone township, was drilling below 700 feet in an old cable-tool hole that had been abandoned at 900 feet. Two miles south of Booneville, the test will be continued below its old depth to the McClosky.

Weather also shut down Parshall-Graham Oil Company's M. J. Simpson 1, wildcat in the SW NW NW 23-1n-10w, which had been attempting to complete after drilling at 3399 feet. It is the deepest hole to be drilled in Indiana.

Oklahoma University Colloid Symposium

The program for the Petroleum Colloid Symposium, offered by the University of Oklahoma at Norman from February 27 to March 2, has been completed. The short course opens with a brief discussion of those problems in the petroleum industry that can be considered as specifically colloidal phenomena, and an outline of the most recent theories pertaining thereto.

The symposium includes a study of the colloidal treatment of muds, of heaving shales, emulsions, water treatment and miscellaneous applications of colloidal chemistry, a general presentation of modern colloidal chemistry and physics, and round-table discussions.

Private conferences with Dr. E. A. Hauser may be arranged after the general discussions. The registration fee is $7.50 per person. Dr. Hauser is a foremost authority on mud, and has assembled some of the most modern equipment yet developed for advancing mud studies.

RAYMOND NAUTH, consulting oil engineer of Buffalo, New York, will discuss a chemical water flooding secondary recovery process he has developed for eastern fields before the Tau Chi Sigma fraternity of St. Bonaventure College February 16 at St. Bonaventure, New York.

Plan two gasoline plants in Wasson-Bennett areas

Midland, Texas.—Two natural gasoline plants are in prospect for the Wasson field, centering upon the Yoakum-Gaines County line, and the Bennett field, Yoakum County. Preliminary surveys have been made and gas contracts are being sought by Shell Petroleum Corporation and Coltexo Corporation, which is affiliated with The Texas Corporation.

Shell Petroleum Corporation, one of the largest lease owners in the two areas, proposes to erect a large well-pressure plant on one of its Geo. Baumgart leases in the east portion of the Wasson field. The site would be a central location for the gathering of gas from both fields.

The oil produced from the two areas carries a nominal sulphur content, and averages between 32 and 35 degrees in gravity. Gas is more abundant in the Wasson sector.

The initial plant installation proposed by Shell Petroleum Corporation calls for a capacity of 17,000,000 cubic feet of gas daily. The gas will afford a yield of eight-tenths of a gallon per 1000 feet, according to unofficial field tests.

Moving in for wildcat test in Wood County

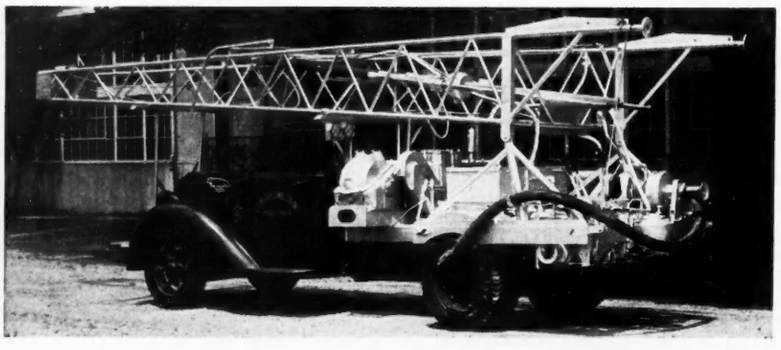
Tyler, Texas.—George Strake, Houston, and associates are moving in materials to proceed with the drilling of a Lower Trinity test on a wildcat block acquired last summer in northwestern Wood County. Location is in the southwest corner of the W. G. Farrier 74-acre lease, Jesse Walker Survey, four miles east of Yantis. Strake et al assumed the deep test obligation in taking over the Atlatl Royalty Corporation's 3700-acre block, with the latter retaining a substantial oil payment.

Griffin pool most active district in Jones County

Abilene, Texas.—Development in the Griffin pool, centering east of the Avoca townsite, is becoming the most active in Jones County on the strength of prolific completions from the 3200-foot sandy-lime along a northwest to southwest trend. Width of the field is likely to be comparatively narrow, and may not embrace the townsite. W. H. Peckham et al's High School 1, situated east of an earlier failure in the townsite, was due to deepen after testing dry in the Palo Pinto at 3272-76 feet. Top of the lime was called at 3265 feet.

Groover, Rose et al's Swenson 1, a mile north by west of production, found water in the Palo Pinto and was abandoning at 3271 feet.

The trend of production to the southwest of Griffin area is open for extensions. Bert Fields, Carey G. King et al's Humphrey 1, NEc Section 22, advanced production one location in this direction with a natural flow of 203 barrels per hour average on a two-hour gauge from pay at 3239-56 feet. Top of the Palo Pinto was logged at 3236 feet, with an elevation of 1539 feet.



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HOUSTON, TEXAS

West Texas Fields

Slaughter expansion northeast appears likely. First failure for west flank of Goldsmith.

Midland, Texas.—Expansion of the productive limits of the Slaughter field, Hockley County, 1½ miles to the northeast appeared probable the past week when Sid W. Richardson et al's A. E. Coe 1 logged broken oil saturated lime in drilling to 4972 feet. First porosity was recorded at 4893 feet. This outpost, situated in SWc Labor 53, League 40, Maverick County School Lands, checked almost level structurally with the nearest producer in logging top of the brown lime at 3750 feet and first solid lime at 4090 feet.

Progress on tests that are seeking to shorten the interval between the Bennett and Wasson fields, Yoakum County, is commanding interest. Texas Pacific Coal & Oil Company's Brownfield 1, SEc NE Section 802, 1½ miles north of production in the Wasson sector, will partially determine the relation of the two areas. It was drilling at 2550 feet. Sinclair Prairie Oil Company's Kendrick 1, east offset to the most eastern producer in Wasson field, was scheduled to resume drilling with cable tools late last week after cementing 7-inch pipe at 4765 feet. Top of solid lime was logged at 4560 feet. Magnolia Petroleum Company made location for Kendrick 1, SW SW NE Section 825, but is holding up operations until a pipe line connection can be assured.

Outpost to Deepen

Continental Oil Company's Wight 1-8, NWc SE T&P Section 8, Block 43, T-1-S, 1¼ miles west of production in the North Cowden field, Ector County, was scheduled to deepen from 4365 feet. At the latter depth the test swabbed 32 barrels of fluid in 12 hours after treating broken lime saturation with 4000 gallons of acid.

Premature explosion of a nitro shot has delayed the completion of a prospective oil producer in the Dunes sector, or the northwest extension of Church & Fields area, Crane County. Great West Producers, Inc.'s University-Texas Company 1, NW NW SW Section 5, Block 30, filled 1300 feet with oil from broken pay at 3202-55 feet. A 60-quart nitro shot was exploded accidentally 400 feet below the surface, and a string of tools later became hung in the shattered pipe. Standard Oil Company of Texas' University 1-4, NW NW NW Section 4, northeast outpost, logged nominal shows in drilling to 3720 feet, and will proceed to the water level. It is structurally low. Magnolia Petroleum Company's University 1-18, NW SW SE Section 18, western outpost, was carrying hole full of water while drilling at 2875 feet.

The first failure for the west flank of Goldsmith field, which has a length of 12 miles, was credited to John Mabee et al's Slator-Shell 1, SE NE NW T&P Section 36, Block 45, although it is two locations from production. Sulphur water was encountered at 4293-4305 feet. The productive limit is considered defined on the east side of the structure, but will be enlarged along the north edge and in the southwest sector.

Sinclair Prairie Oil Company's Cowden 4, SW NW NE T&P Section 1, offsetting production on the east edge of the Emma pool, Andrews County, encountered a tight lime condition in drilling regular pay at 4175-4214 feet. The well failed to flow natural after acid treatment and a nitro shot. Late test on swab averaged 7 barrels hourly while cleaning out shot cavings.

Osage Drilling Company is starting operations on University 1, SWc SW Section 36, Block 10, offsetting production. This 165-acre tract was purchased last June by Phillips Petroleum Company for a cash bonus of $15,000 and assigned to the above company for 3/16 over-riding royalty.

Atlantic Refining Company et al's Cowden 1-B, C SE NW T&P Section 1, T-1-N, 2/3 of a mile southwest of the abandoned discovery of the Emma area, was awaiting a production test at 4160 feet. Pipe was cemented at 4080 feet after logging saturation below this level.

WEST TEXAS Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Andrews County (Parker)—		
Honolulu Oil Corp., Parker 1-18..	*	4803
Crane County (Gulf-McElroy)—		
Gulf, McElroy 188	1026	2919
Ector County (Foster)—		
Arrow Drl. Co.-York-Harper, Foster 6	1067	4325
Atlantic, Johnson 4-B	314	4276
Broderick & Calvert, Foster 15	1198	4230
M. B. K. Drl. Co., Foster 3-C	401	4363
Foster 4-C	1993	4290
Stanolind, Witcher 8	1026	4195
Ector County (Goldsmith)—		
Cities Service, Cummins 1-F	309	4275
Gulf, Goldsmith 153	468	4266
Goldsmith 154	1296	4181
Goldsmith 155	840	4193
Goldsmith 158	760	4221
Landreth Prod. Corp., Scharbauer 5-M	816	4185
Phillips-Pure, C. Cowden 51	1304	4165
C. Cowden 53	250	4200
C. Cowden 54	2414	4176
Ector County (Jordan)—		
Atlantic, University 3-D	1560	3650
Shell, University 5-D	1167	3644
Ector County (North Cowden)—		
Stanolind, Cowden 75	1227	4323
Fisher County (Royston)—		
Gen'l Crude Oil Co., Flores 1	*	3546
Gaines County (Wasson)—		
Continental, Wasson 2-52	432	4983
Howard County—		
F. W. Merrick-Murphy-Lamb, Chalk 5-B	1488	2891
Moore Bros. Corp., M. H. O'Daniel 6-A	840	2841
Murko Oil & Roy. Co., Chalk-Conoco 5-A	1152	2889
Shell, T. P. Land Trust 6-A	345	2821
Sun, T. P. Land Trust 1	382	2794
Jones County (Wildcat)—		
Farris et al, B. D. Doty-Beasley 1	*	1745
Jones County—		
Bert Fields et al, Taylor 1	3024	3233
Iron Mt. Oil Co.-Humble, Taylor 2	548	3235
King Oil Co., Carter 8	600	1934
Pet. Producers Co., C. W. Gill 1	*	2194
Ungren-Frazier et al, Hamilton-Cox 1	168	3273
Pecos County (Payton)—		
British-American O. P. Co., Payton 11	344	3089
Pecos County (Pecos Valley)—		
Union O&M Co., Magnolia-Lessenich 2-D	477	1875
Taylor County—		
Cooper et al, Bowles 2	9	1755
Taylor County (Wildcats)—		
Rowan-Nichols Oil Co., Martin 1	*	2410
Tal-Vez Oil Co., Lindsey 1	*	2404
Upton County (Gulf-McElroy)—		
Gulf, J. T. McElroy 187	337	3225
Upton County (McCamey)—		
Anderson-Prichard Oil Corp., Burleson 1	985	2207
Shell, Baker 7	720	2235
D. Bowen 39	307	2130
Sylva Oil Co., Baker-Conoco 10	1016	2367
Ward County—		
Cities Service, Brandenburg 3	262	2088
Daniels & Pardue, Hardage-Wilson 2	85	2420
Gulf, Estes 114	430	2660
Hutchings 114	965	3080
Magnolia, Sealy 15-46	250	2850
Roeser-Pendleton, Inc., Johnson 1-B	106	2057
Yoakum County (Bennett)—		
Mabee et al, Willard 3	2271	5219
Magnolia, Bennett 6	780	5250
Yoakum County (Wasson)—		
Texas Co., A. B. Smart 3	416	5126
H. O. Wooten 4	820	5125

* Failures; † Junked; ¶ Million cu. ft. gas.

North Texas Fields

Clay County wildcat logs show above Strawn lime

Wichita Falls.—Wildcat interest in North Texas shifted to southwestern Clay County late last week when L. T. Burns et al's Browning 1, SEc Block 94, J. H. Belcher Survey, 7 miles south by east of Halsell, logged an oil show above the Strawn lime zone at 3615-25 feet. Formation tester yielded a small amount of oil with salt water. The test was drilling at 3650 feet, according to late reports, and at this depth was in Upper Strawn. It is contracted to drill to water in the Ellenberger, or 5500 feet.

Chapman and McFarlin's Wilson 1-E, northwest portion of the Hull & Silk field, Archer County, flowed 375 barrels oil natural through casing in 12 hours on a pre-

NORTH TEXAS Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Archer County—		
Continental, DeMoss 2	45	988
Cree & Hoover, Turbeville 2	†	612
Archer County (Wildcats)—		
Bridwell Oil Co., H. Harrison 1, sec 7	*	1120
Fagadau et al, Abercrombie 2	*	1302
Clay County—		
Beasley et al, Shumake 5, blk 4	74	1150
Bridwell Oil Co., Thornberry 26, blk 5 (key well)	*	1090
Duncan-Arnhold et al, Duncan 6, blk 14	164	1166
Cooke County—		
Murray et al, Trubenbach 8	*	926
Whitfield-Pearson & Grimes, B. Voth 2	436	1793
Haskell County (Pardue)—		
Forest Dev. Corp., Pardue 4	*	2873
Throckmorton County—		
Butler & Daniel Bradley 4, sec 906	*	380
Wichita County (K-M-A)—		
Hanlon-Buchanan, Fassett-Tuttle 5-B	840	3987
R. G. Drl. Co., Lewis 1 (1-ac)	720	3835
Smith et al, Denny 1-A (1-ac)	720	4006
Ven-Mex Oil Co., Griffin 2-A	1176	3829
Wichita County—		
Dorian & Jackson, Denny 3	1	200
Pilkerton et al, Overby 9	*	725
Young County—		
Atchley et al, City Nat'l Lig. Trust 1, sec 225	*	998
Pet. Producers Co., Boone 14, sec 1	*	507
Pitzer-West & Lion O. R. Co., Bullock 1	801	4339
Reno Oil Co., A. Thomas 1	*	4840
Worth Oil Co., Collier 3-A, blk 21	4	551

* Failures; † Junked; ¶ Million cu. ft. gas.

liminary test from Lower Strawn at 4247-4307 feet. Tubing has been installed for a proration gauge. It is separated from the main group of 4300-foot wells by a 5200-foot failure.

Omohundro et al's T. W. Wilson 1, Archer County wildcat 2½ miles southwest of Mankins, was listed for abandonment at 4450 feet. Top of the Strawn lime was called at 3824 feet.

Bridwell Oil Company's Oil Investment 31-B, 3½ miles southwest of the Chalk Hill field, original deep strike for Archer County, logged top of the Palo Pinto section of the Lower Canyon at 3345 feet, and was drilling at 3650 feet.

Fifteen feet of Strawn saturation cored by Sinclair Prairie Oil Company's Best 3, west offset to its discovery in the Best pool, near Walnut Bend, Cooke County, failed to make a flowing producer when the well was tested at 4940 feet. Additional cores were scheduled to be taken late last week. Pipe has been landed for the completion of Best 5, south offset to production.

Propose extension of K-M-A repressuring

Wichita Falls, Texas.—More general application of pressure maintenance through the recycling of gas is to be sought for the K-M-A deep area. Operators are to meet here February 15 in the offices of Continental Oil Company to discuss a field-wide project that will supplement present installations.

Deep Oil Development Company has been returning residue gas from its small natural gasoline plant on the Munger deep discovery tract to the Strawn horizon for more than a year. Continental Oil Company, owner of a large natural gasoline plant on the Waggoner Bros. ranch, lot 7, BS&F Section 11, A-387, and 4 nearby lease owners formed a unit of 3338 acres last September for pressure maintenance. Each participant has converted an oil producer into an input well, and is being allocated a ratable portion of the gas residue from the plant. Phillips Petroleum Company and Sunray Oil Company, joint owners of a large natural gasoline plant in the Kadane sand sector, are also likewise returning residue gas to the oil zone.

San Angelo, Texas.—Mertzon Refining Company, owner of a 100-barrel crude skimming plant that serves the Mertzon pool, Irion County, has been purchased by W. L. Jones from C. A. Middleton and associates. Jones formerly operated the Midway Refining Company's plant at Goldsboro, Texas.

TEXAS PANHANDLE Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Carson County—		
Cities Service, Burnett 28-A	¶42.3	2670
Haze & McGill, Cooper 6B	510	3153
Collingsworth County (Wildcat)—		
White & Knoll, Wischkamper 1	*	2377
Gray County—		
Bradshaw O&G Co., Sackett 9	338	3308
Hutchinson County—		
Gulf, Cockrell 6-B	294	3093
Gulf & Panhandle, Dial 89	257	3082
Phillips, Lone Star 3	193	3190
Texilvania Oil Co., Harvey 6	488	3055
Tide Water Associated Humphries 5	326	3192

* Failures; † Junked; ¶ Million cu. ft. gas.

East Texas Fields

Plugging wells in East Texas becoming routine operation

Kilgore, Texas.—Plugging of depleted oil wells in the East Texas field is becoming a routine matter that will eventually be a factor in checking the growth of total wells. During 1938 plugging operations were completed on 124 former producers, while 1765 new oil wells were recorded for the same period. Abandoned producers prior to 1938 amounted to 199, according to available records.

Excessive volume of salt water developed by edge wells that lacked sufficient oil pay section to successfully plug back accounted for the majority of the abandoned wells. The depletion of the thin-sand pay on the extreme east flank of the field also contributed to the total. An undetermined number of wells were plugged because of mechanical difficulties, and some of these will be replaced by twin tests.

Plugged well reports filed with the Texas Railroad Commission during January indicate that a large number will be stricken from the proration schedule during 1939. Closer supervision of producing wells by federal and state enforcement bodies is cutting down the volume of dormant and submarginal wells that heretofore took credit for full allowable, with the deficit filled from more productive wells.

Currently the field has a base allowable of 522,654 barrels daily from 25,795 wells, including 448 wells that are classed as sub-marginal producers. The latter have a combined maximum output of 5221 barrels daily, or 3739 barrels short of their base quota of 20 barrels daily each. Actual production is restricted to a 5-day week basis.

Pine-Island-in-Texas being extended three miles

Shreveport.—A three-mile southwest extension of the Nacatoch producing horizon of the shallow Pine Island field in Marion County, Texas, appeared likely last week after M. Luther Clements and associates' Burks 1, Ganes Coor Survey, logged 5½ feet of saturated sand between 1158 and 1166 feet and set 6-inch casing at 1158 feet. One mile southwest of Clements' test, Webb and associates have derrick up for R. S. Terry 1, Wiley Coor Survey, a Tokio test.

Officials of Superior Oil Corporation have announced that rig used on its recently abandoned San Augustine County, Texas, wildcat will not be taken to a southeastern Shelby County, Texas, location at this time, as previously reported.

Purchaser will recondition East Texas wells

Kilgore, Texas.—Hubbell Production Company, Fort Worth, headed by Carl O. Hubbell, big league baseball pitcher, has acquired 3 leases in the Joiner sector of the East Texas field from Royal Petroleum Company. The E. B. Alford 5-acre lease, I. G. Parker Survey, with 2 pumpers, was bought for $8000 cash per well. Both wells had been off production for some months, and when cleaned out by the purchaser tested 17.4 barrels and 20.5 barrels potential each. A cash consideration of $50,000, plus the assumption of 1/16 over-riding royalty, was involved in the acquisition of the I. W. Wooley 40-acre lease, with 8 pumpers, and the I. W. Wooley 5-acre lease, with 2 pumpers, both in T. H. Smith Survey. The majority of these wells have been off production, and will be reconditioned.

Two hundred wells started in Texas

Permits for drilling 202 new wells in Texas were approved by the Texas Railroad Commission last week, 48 more than were allowed the week before.

There were no locations approved in the East Texas field. East Central Texas operators reported seven new locations.

The Gulf Coast area topped the list with 69 permits, including ten in Harris County and ten in San Patricio County. From Southwest Texas 36 locations were reported including 13 in Duval County. The commission approved 34 permits in West Texas with 13 in Ector County while West Central Texas operators reported 13 locations.

There were 30 permits approved in the North Texas District including 13 in Wichita County, while the Panhandle operators reported 13.

EAST TEXAS Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Joiner Area—		
Combined Oil Co., Eaton 24 (99.88-ac)	3200	3700
Cooper et al, Deason 3 (3-ac)	4000	3660
Georgian Oil Corp., G. Cole 1-D (48-ac)	2000	3833
Humble, Blackwell 63 (325.79-ac)	3600	3643
Blackwell 64 (325.79-ac)	7100	3635
Blackwell 65 (325.79-ac)	5000	3628
Kilgore Area—		
Atlantic, Griffin 22 (85.88-ac)	2300	3666
Byrd & Frost, Holt 2 (6½-ac)	8000	3645
Gen'l American Oil Co., Sexton 12 (100-ac)	200	3620
Gulf, Sexton 23 (165.58-ac)	1600	3662
Humble, Laird 42-A (230-ac)	4500	3678
Thomas 22 (59.05-ac)	2500	3598
Humphrey et al, Spear 27 (20.3-ac)	2400	3576
Nathan et al, Walker-Sun 4 (40-ac)	600	3606
Overton Ref. Co., I&GN 37 (19.58-ac)	1500	3560
Shell, Willoughby 27 (57.7-ac)	4600	3606
Longview Area—		
Gen'l American Oil Co., McGrede 27-A (84-ac)	6800	3631
G. E. Hubbard-W. W. Lechner, McGrede 5	7000	3659
Iowa Payne Oil Co., Akin 8 (20-ac)	7300	3579
Lucy Pet. Corp., McBee-Fisher 13 (65-ac)	6200	3511
Jim McMurrey et al, T. Snoddy 6 (10-ac)	7000	3605
Shell, Hampton 28 (169-ac)	7100	3742
Strebor Oil Co., Finley-Thomas 3 (5-ac)	6000	3507
Sun, Reppond 8 (58.62-ac)	3000	3657
W. & R. Inv. Co., Moore 4 (5¼-ac)	8400	3558
Yule et al, J. H. Sheppard 1	2500	3678
Henderson County (Opelika)—		
Tide Water-Seaboard-Humble, McGee 1 (342-ac)	¶7.9 & 436	8216
Titus County (Talco)—		
Humble, L. Clark-Humble 1	35	4350
Morris County (Wildcat)—		
V. A. Hughes & Co., E. Hall 1 (177½-ac)	*	4314
Rusk County (Wildcat)—		
Ham & Boggess (J. Wiley, Tr.), A. Griffin 1 (51-ac)	*	3631
Marion County (Jefferson-Rodessa)—		
Hollandsworth Drilling Co., H. Hurst 2, Jno. Hanks sur.	300	6073
Texas Co., Chatten 3, W. R. Meyers sur	595	5988

* Failures; † Junked; ¶ Million cu. ft. gas.

Southwest Texas Fields

New field three miles southwest of Tomoconnor. Seaboard well yields first crude at Riverside.

Corpus Christi. — Establishing crude oil production in the Riverside field, two extensions to that area, a new pool in Refugio County, two potential producing areas in Jim Wells County, a probable salt dome field in Brooks County, and several extensions to other areas summed up a boom-like week along the South Texas Gulf Coast.

Copano Oil Company's C-1 Tomoconnor, in Refugio County, cored a hard gas sand at 5854-66 feet, followed by 11 feet of good oil sand to 5877 feet. Casing was landed on bottom and the well was being finished through perforations in the lower part of the sand. The horizon, in the Frio, corresponds to the zone at the same level in the Tomoconnor field, 3 miles to the northeast.

The potential discovery is in a 786.45-acre lease in the Tim Hoyt Survey and is 1½ miles northwest of Quintana Petroleum Corporation's O'Connor B-2, which was carried to 9937 feet. The new well, if a large producer, will have an important bearing on the trend. Tomoconnor field is one of the largest and most prolific reserves along the Texas Gulf Coast, and another area of similar proportions would bring an extensive drilling program.

La Rosa Busy

An aggressive drilling program is under way in the La Rosa field, also in Refugio County, which has oil production in the 5800 and 6300-foot sands, corresponding to the Tomoconnor field. Between these areas is the Bonnie View field, with one Frio sand gasser.

Seaboard Oil Corporation of Delaware's Ellen C. Wilson 2, Block 9, Wright Subdivision in Nueces County, flowed 14 barrels of 33.5-gravity pipe line oil per hour through 3/16-inch top and ¼-inch bottom choke when gauge was made through testing tool set on hook wall packer inside of the casing. The well is 4650 feet west of the gas blowout which opened the Riverside field and is the first crude producer in the area. The well, carried to 5037 feet, made several attempts to complete through perforations. Gas always broke in and the third attempt, after two squeeze jobs, resulted in success. The perforations were made at 4996-4999½ feet, at the bottom of the sand. Tubing was run into the hole and the well was cleaning naturally.

Perforations have been made in the lower part of the sand logged 4999-5007 feet in Republic Natural Gas Company's Seaboard 1, Block 3, which is 6000 feet south of the Seaboard crater. The well had been carried to 5525 feet, but plugged back for completion. The test will provide another extension to the area. In the meantime, Heep Oil Corporation et al's G. W. Smith 1, tract 9, and 8500 feet south and west of the crater, was at 5055 feet, perforating in the lower portion of the sand logged 5016-45 feet.

H. H. Howell's W. T. Wright, Jim Wells County wildcat on a farm-out from the Magnolia Petroleum Company, was waiting on cement after setting casing to 6796 feet and will test a sand at 6640-6780 feet, indicated by electric log and further proved in sidewall samples. The well is in the southwest corner of a 2100-acre lease in the Ross M. Bridges Survey, nine miles north of Alice. A second well on the same tract, but one mile northwest, is being drilled by Howell. It is below 4000 feet.

To Test Near Alice

Gravis and Doran are preparing to drill plugs and perforate casing for production test in Mrs. Frances Clark 1, about two miles east of the East Alice field, Jim Wells County. The well cored a gas sand with oil show at 5143-58 feet and an oil sand 5198-5238 feet. It is bottomed at 5300 feet with casing set on the bottom. Production test will be attempted through perforations in the 5200-foot pay, apparently in the top of the Vicksburg. The well is on

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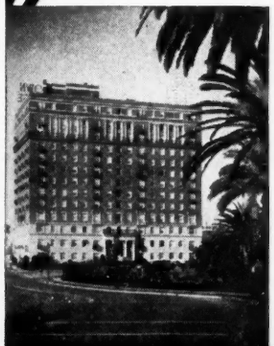

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a farm-out from the Humble Oil & Refining Company and is in the northwest corner of a 357-acre tract in the Lopez Grant.

Magnolia Petroleum Company's Sam Maun 1, 3 miles southwest of La Gloria, Jim Wells County, had progressed to below 7250 feet in the Vicksburg and was drilling ahead. It is to be plugged back for completion as a distillate producer if it fails to find lower sands.

The two extension wells to the East White Point field, San Patricio County, have been gauged. Houston Oil Company of Texas' Baldwin 1, about ½ mile northwest of the field, flowed 163 barrels in 24 hours through ⅛-inch choke under pressures of 900 pounds on tubing and 1040 pounds on casing. Gravity of the crude, coming from perforations 5657-63 feet, is 39.2 degrees. About 9000 feet west of the field and in the old White Point gas area, Easterwood and Cage's Dunn 1, flowed 134 barrels of oil per day through ⅛-inch choke with 760 pounds on the tubing and 300 pounds on the casing. The well sure.

is producing 29.08-gravity crude, which may indicate that it is not the same sand as the East White Point field. The production is from Frio sand at 5672-76 feet.

Another oil field appears possible on the Gyp Hill prospect in northeastern Brooks County, where Southern Minerals Corporation et al's T. C. Proctor 1, after perforating at 6855-70 feet, was washing in. The well has been carried to 7726 feet; electric log indicated sands at 6350-85 feet and 6840-80 feet. Casing was set at 6920 feet. It is in the Los Olmos and La Blanca Survey, 2 miles south of Falfurias.

Transwestern Oil Company's Dunlap 1, 6000 feet southwest of the East Premont field of Jim Wells County, after a series of tests has been completed as a distillate producer through perforations at 5470-75 feet. The well flowed 92½ barrels of fluid in 21 hours through ¼-inch choke with 1600 pounds tubing and 1100 pounds casing pressure.

SOUTH TEXAS

Completions

CORPUS CHRISTI DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
Aransas County—		
Atlantic, Porterfield 14-B (McCampbell)	1000	7224
Rutherford, McCampbell 1 (McCampbell)	1000	7250
Bee County—		
Chapman Minerals, Ablinger 1, Beeville area (WC)	*	6013
Brooks County—		
Humble, McGill 3, Kelsey area (WC)	375	4728
Hidalgo County—		
Fohs Oil, Guerra 2-B (Samfordyce)	450	2872
Jackson County—		
Dale Oil, Drushel 1 (Edna)	¶75	4851
Jim Wells County—		
Transwestern, Dunlap 1, East Premont area (WC)	¶10 & 100	6766
W. B. & Jewell Osborn Oil, Thigpen 1, East Alice area (WC)	400	5397
Nueces County—		
Killam, Moore 1 (Clara Driscoll)	350	5725
Lockhart, Purl 4 (Agua Dulce)	¶10 & 100	4809
Southern Minerals, King 15 (Bentonville-King)	¶10	4123
Union Producing, Brown 1 (Agua Dulce)	¶15	13,728
Refugio County—		
Phillips Petroleum & Trinity, Pavlecek 1 (LaRosa)	350	6525
Quintana, Heard 30 (Tomoconnor)	1750	5925
Tom O'Connor A-78 (Tomoconnor	1600	5922
San Patricio County—		
Easterwood & Cage, Dunn 1 (White Point)	450	5676
Grote & Corgey, McCampbell 4 (McCampbell)	1500	7140
Nelson 2 (McCampbell)	1000	7140
Houston Oil, Baldwin 2 (East White Point area) (WC)	575	5681
Nash, Young-Henderson 1 (McCampbell)	700	7145
Nueces, Amman 1 (McCampbell)	1000	7131
Richardson, Cotter & Ayers 1 (McCampbell)	1100	7215
Richardson, Mills 2 (McCampbell)	1125	7181
Wellington, Welder Heirs 5 (Angelita)	35	5376
Victoria County—		
Barnsdall, McFaddin 17 (McFaddin	360	4405
Gulf, Traylor B-17 (Heyser)	450	5488
Transwestern, McFaddin E-10 (McFaddin)	450	4411

LAREDO DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
Duval County—		
Argo, Fee 3 (Hoffman)	176	2842
Cuellar Brothers, Cuellar 1-a (Hoffman)	125	2547
Hiawatha Oil, Parr 22 (North Sweden)	350	5543
Humble, White B-8 (Lundell)	60	1526
Interstate Minerals, Milano 1, 1 mi e Loma Novia field (WC)	*	2903
Key State, Fitzsimmons 1, Fitzsimmons area (WC)	*	5014
Lanning, Noake & Evans, Peters 7 (Rancho Solo)	75	1882
Longhorn Drilling, Miller 2 (Longhorn)	380	4900
Magnolia, Duval County 3 (63) (Casa Blanca)	40	1208
Duval County 2 (101), 12,000 ft ne Moca field (WC)	*	2765
Weil 24 (Hoffman)	60	2788
Owens & Anderson, Lawson 1 (Piedras Pintas)	50	304
Saltmount, Puig 6-A (North Sweden)	172	4805
Jim Hogg County—		
Humble, Bass 6, Kelsey area (WC)	50	4730
Live Oak County—		
Brauer & Holland & Smith, Bonham 1, South of Ezzell (WC)	60	1397
McMullen County—		
Ezzell, Fee 28 (Ezzell)	*	1561
Webb County—		
Morton, Laurel Brothers 1, North Killam area (WC)	*	2559
Superior, Laurel Bros. 2-C (North Killam)	*	2606
Zapata County—		
Nordan & Morris, Haynes 12-C (Comitas)	42	1180

SAN ANTONIO DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
Bexar County—		
Priest, McCullough 1, Von Ormy area (WC)	*	1004
Stiles, Scherrer 1, 12 mi s San Antonio (WC)	*	1077
Caldwell County—		
Adams & Richards, Flowers & Leyendecker 5 (Branyon)	*	2354
Brownlee-Pope, Brownlee 1 (Walnut Creek)	*	1700
Dudley, Becker 1, L. L. Joseph survey (WC)	*	1117
Martell, Gray 2-B (Salt Flats)	*	2638
Malone 7 (Salt Flats)	85	2697
Gonzales County—		
Sorrell & Mitchell, Culpepper 1-A, 1½ mi se Smiley (WC)	†	2865
Guadalupe County—		
Hueners, Bauer 1, 4 mi sw McQueen (WC)	*	1462
Kimble County—		
Plateau, Bolt 1, Junction area (WC)	3	1863
Kinney County—		
Rose, Gaebler 2, 12 mi nw Spofford (WC)	*	234

* Failures; † Junked; ¶ Million cu. ft. gas.

Sparta-Wilcox trend runs into Live Oak County

San Antonio.—Sparta-Wilcox trend development has been extended into South Texas with several deep projects planned. Live Oak County will receive two wells in this program. One is to be drilled by the Sunset Oil Company on the northeast flank of the Mount Lucas Gas Field, controlled almost entirely by Houston Oil Company of Texas. Details of the arrangement have not been announced, but it apparently is a farm-out from the latter company. Glenn McCarthy is to drill the test. It will be carried to 9500 feet or production, according to present plans.

To the northwest and at the town of Kittie, Cities Service Oil Company and Standard Oil Company of Texas have farmed out about 3400 acres of their unitized block to Smith et al for drilling of a test. The contract calls for a Yegua operation, but the well is primarily intended as a Wilcox operation.

In DeWitt County, a deep test is planned near Yorktown, apparently to the Sparta-Wilcox zone. Several other such tests are projected along the same zone.

A new shallow field was added in Live Oak County with the final completion of Brauer, Holland and Smith's Bonham 1, Block 3009, Simmons Subdivision. The well is in a Hockleyensis sand at 1390-07 feet, where it is pumping about 65 barrels of crude per day. The test is three miles southwest of Three Rivers and just south of the Ezzell field. The area will be known either as White Creek or South Ezzell.

Aloco buys Texaco holdings in Wasson and Bennett

Midland, Texas.—The Aloco Oil Company, Dallas, has exercised option taken last December for the acquisition of The Texas Company's producing and undeveloped leases in the Yoakum County sector of the Wasson field and the Bennett area.

The deal is one of the largest consummated in West Texas in recent years. It involves 17 oil wells completed prior to the option date, and four additional wells completed within the past two weeks for the account of the purchaser.

The acreage amounts to approximately 16,000 acres, with oil production considered assured for between 6000 and 8000 acres.

The Texas Company is being paid $660,000 cash for the original 17 wells, and will be paid one-eighth over-riding royalty from wells that produce less than $1600 revenue per month. One-fourth over-riding royalty will apply when the monthly revenue per well exceeds $1600.

A 200-well drilling program has been projected by The Aloco Oil Company for the above properties.

An official of the company stated that drilling on the leases farmed out by The Texas Company will be restricted to 15 wells during 1939, unless a greater number of offsets cause an upward revision of the program. The spokesman added that 40-acre well spacing would be favored.

Arrangements have been perfected by The Aloco Oil Company to contract a crude gathering system and sell a maximum of 5000 barrels daily for five years to Atlantic Petroleum Purchasing Corporation, crude purchaser for Atlantic Refining Company.

The Aloco Oil Company will build a 30-mile 6-inch line from its field station to Hobbs, New Mexico, where deliveries will be made to Atlantic Pipe Line Company's trunk line to Atreco, near Beaumont. Oil deliveries will begin upon completion of the Hobbs connection. Aloco does not propose to purchase outside oil in the Yoakum County fields for the time being.

Aloco is controlled by Toddie Lee Wynne, Clint W. Murchison, George J. Greer and Ruston L. Ardrey.

Texas Gulf Coast

Cement job delays showdown on Wilcox test at Ace. League City outpost to be tested at 10,060 feet.

Houston.—Final show-down on the Wilcox strike at Ace, Polk County, is delayed while cement is setting around 5½-inch casing which has been set at 7788 feet in Peyton Brothers' Kirby-West B-3, G. S. Thomas Survey. As was reported last week, this test topped broken sands showing oil at 7749 feet and cored to 7788 feet, still in the sand. A drill-stem test at 7735 to 7755 feet showed 20 stands of 34.4-gravity oil in 15 minutes.

Cockfield production was discovered at Ace by Dick Schwab in December, 1933. Development has been confined to about 50 acres, and 120,000 barrels of the 500,000-barrel potential heretofore assigned the field has been recovered. There has been little activity in the area during recent months.

At Segno, also in Polk County and east of Ace, Providence Oil Company's Wing 2, had an initial flow of 742 barrels daily when perforated with 77 shots between 8090 and 8114 feet—in Wilcox. Flow was through ¼-inch choke; tubing pressure 1250 and casing pressure 1450 pounds.

TEXAS GULF COAST Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Clinton—		
Stanolind, Oates 1-B	*	4608
Dickinson—		
Cron-Gracey, Davant & Everberg 1	¶50	9050
Pure, M. Stewart 3	167	8166
Eureka—		
Means-McGehee, L. Lackner E-1	619	7719
Tide Water, L. Lackner 3-A	142	7705
Fairbanks—		
Amerada-Stanolind, Arriola 2	141	6843
Cougat 4	139	6865
Dawson 4	*	7005
Mills 8	174	6855
Spaulding 2-A	162	6845
Noble and Baker, Hilligeist 5	148	6849
Williams & Thompson, Deacon 5	306	6858
Friendswood—		
Humble, West Fee 4-B	573	6043
Whitcomb 5	573	6046
Hastings—		
Stanolind, Curkeet C-32	550	6080
Hull—		
Republic, Dolbear 164	22	1990
Dolbear 143	38	2400
Moss Bluff—		
Lewis & McCom, Harrison 2	*	835
Old Ocean—		
Old Ocean Development Co., Patterson 1	*	10500
Orange—		
C. L. Brown, Lutcher Moore 2-B	130	5592
Gulf, Orange National Bank 3	607	5939
Pierce Junction—		
Hamil & Smith, Bashara 2	268	3798
Segno—		
Providence Oil Co., Wing 2	742	8155
South Cotton Lake—		
Salt Dome, Lawrence 3	132	6495
Thompsons—		
Gulf, Booth X-12	89	3220
Humble, George X-10	*	3752
Tomball—		
Humble, Michel 3	46	5554
Martens C-1	216	5561
Milo 9	360	5548
Shell, Tyson 2-B	511	5570
West Columbia—		
Texas Co., Abrams 30	146	4526
Withers—		
General Crude, Thompson 1	105	5554
Austin County—		
Crown Central, Heubner 1, w of Bellville, R Stolze sur	*	4004
Grimes County—		
Holt et al, Greer 1, Carlos area, P. B. O'Connor sur	*	2761

* Failures; † Junked; ¶ Million cu. ft. gas.

Echo Well Quits

Sun Oil Company's Lutcher-Moore A-1 at Echo, Orange County, a few weeks ago hailed as opening a new field, has quit flowing and is shut down awaiting orders.

Phillips Petroleum Company has squeezed perforations and will test at 10,060 feet in Patton 1, northeast of production at League City, Galveston County, after a test at 10,156-10,180 feet showed 7500 feet of salt water and no oil. On the west side of this field, Gulf Board Oil Company and Salt Dome Oil Corporation's Ross & Stewart 1 cored water sand from 9293 to 9313 feet and George Echol's Ross & Stewart 2 was coring in sandy shale at 9079 feet, after coring oil sand at 8957-8969 feet.

At Moss Bluff, Liberty County, Crown Central Petroleum Corporation has set 7-inch casing on bottom and will make a production test in Kyle 1 which drilled 6 feet into cap rock in going to 646 feet, having logged several feet of oil sand. Under contract with Texas Gulf Sulphur Company, which owns sulphur rights on the dome, no more than 7 feet of cap rock can be penetrated.

Deep Test at Eureka

Jack Frazier is making a test of the deep sand at Eureka, Harris County, in Lackner 2, which is bottomed at 8155 feet with 5½-inch casing set at 8114 feet. Gas and distillate sand was cored from 8055 to 8093 feet. Frazier's Helberg 3 is flowing 25 barrels of oil per hour through ¼-inch choke, casing having been perforated with 43 shots between 7694 and 7704 feet. Tubing pressure was 1250 and casing pressure 1750 pounds.

Two wells at Fairbanks, Harris County, were testing at the end of the week. E. M. Hailey's Brown 1, J. Clarkson Survey, was flowing 275 barrels of fluid per day, 10 percent salt water, through 3/16-inch choke, from perforations at 6838 to 6840 feet; tubing pressure 800 and casing pressure 475 pounds. Housh & Thompson's Salge 1 was cleaning into burning pits, flow being through ⅛-inch choke and from 6838 feet.

Coyle-Concord Oil Company has killed the flow in Powell 4 at Garwood, in Colorado County. Casing perforations at 5923-26 feet, through which a flow of 50 barrels per day, 10 percent salt water, was coming when it was killed, will be squeezed with cement. The flow was through 9/64-inch choke and pressures of 900 pounds on tubing and 2100 pounds on casing were recorded. In northeastern Colorado County, Mills Bennett Production Company's Truchard 1 was drilling below 5875 feet in shale, after coring sand with a slight show of oil at 4719-20 feet. Objective of this wildcat is the Wilcox.

Detailed information is being withheld on Grisso Royalty Company's Smith 1, Arcola area, Ft. Bend County, which attracted attention last week when heavy mud was pumped in to stop a threatened blowout. At the end of the week an electric log was being run at 5050 feet.

N. W. Hunter's Lingneau 1, on the northwest flank at Big Creek, Ft. Bend County, is cutting and pulling drill pipe stuck in heaving shale at 6130 feet. Cores from 5066 to 5247 feet recovered broken sands with shows of oil, gas and salt water.

In the Anchor area, Brazoria County, Humble Oil & Refining Company's Yates 1 was drilling below 8853 feet in shale, running 500 feet lower than a recent dry hole. Large Discorbis was topped at 7360 feet and Heterostegina at 7720 feet.

Old Ocean Defined

Old Ocean Development Company's Patterson 1, Polly & Chance Survey, was abandoned last week at 10,500 feet, defining production at Old Ocean, Brazoria County, on the north. Several tests showed salt water in the Frio.

West of Bellville in Austin County, Crown Central Petroleum Corporation's Otto Heubner 1, has quit in Cockfield shale at 4004 feet.

In the Mt. Houston area of Harris County, where Jack Frazier's Griffith 1 indicated production possibilities in Miocene some time ago, Hargrove & Hunter have made location for Griffith 1, 500 feet north of Frazier's test. It is proposed to drill to 4500 feet and test the level of the show found in the former hole.

Five miles northeast of Huffsmith, in an area of Harris County where several holes have been drilled to the Cockfield, Cron & Gracey have made location for R. D. McDonald 1, 330 feet from the north and east lines of a 46-acre tract in the Andrew Lawson Survey.

Ten-acre spacing for Hitchcock

The Texas Railroad Commission has issued an order providing for 10-acre spacing in the new Hitchcock field in Galveston County. The wells will be spaced 660 feet apart and 330 feet from lease lines.

The plan of proration is acreage and per well with 50 percent allocated on each factor. The regulations require 1000 feet of surface casing set with 225 sacks of cement and an oil string cemented 800 feet above the shoe.

Riverside hearing delayed

The Texas Railroad Commission has postponed until February 13 its hearing on the Riverside field located in Nueces and San Patricio counties. The hearing was set for February 4 at the request of Seaboard Oil Company; however, the applicant asked for delay in order to obtain further data.

Katy hearing set

The Texas Railroad Commission has scheduled a hearing for February 17, at Austin, on the new Katy field in Waller County. The purpose of the hearing will be to prepare spacing and other operating rules for the field.

South Louisiana

Bastian Bay test drilling after coring second sand. Shell prepares to test shows in La Pice wildcat.

Lake Charles.—Drilling in shale below 8821 feet after having cored a second oil sand at 8298-8309 feet—the first was logged at 7952-55 feet—The Texas Company's Bastian Bay 1, Section 43-20s-28e, Plaquemines Parish, is looked upon as a possible field opener. Bastian Bay prospect is southwest of Quarantine Bay field and south of Potash, and the deep sand cored is believed to correspond to a producing horizon in Quarantine Bay. The prospect block was detailed by reflection seismograph by Louisiana Land & Exploration Company and then turned the block to The Texas Company.

On the Paradise prospect, St. Bernard Parish, The Texas Company is running a string of 9⅝-inch protection casing in Louisiana Land & Exploration Company 1. The hole is bottomed at 8975 feet. The wildcat is reported to have cored some oil sands which probably will be tested later on.

On the LaPice prospect in St. James Parish, Shell Petroleum Corporation is preparing to make a drill-stem test on Schexnayder 1 after coring to 9773 feet in sand topped at 9750 feet. A broken sand shale with a slight show of oil was logged around 9681 feet is to be tested. Schexnayder 1 has encountered several broken shows of oil up the hole. If the 9681-foot show does not yield commercial oil the hole will be drilled deeper.

New Sand at Lake Hermitage

A new oil sand was discovered at Lake Hermitage field, Plaquemines Parish, last week by Gulf Refining Company and Humble Oil & Refining Company; Lafourche Basin Levee District 9, Section 2-18s-25e, cored sandy shale showing oil from 3116 to 3166 feet and set 7-inch casing at 3121 feet. The well came in flowing 130 barrels of pipe line oil daily through a quarter-inch choke.

Shell Petroleum Corporation has completed its second producer at West Lake Verrett field, St. Martin Parish. Jeanerette Lumber Company 2, northwest offset to the discovery well flowed 206 barrels of oil and 345 barrels of salt water daily through a 14/64-inch choke with a tubing pressure of 750 pounds and a casing pressure of 1000 pounds. The gas/oil ratio was 665 to 1; depth, 8057 feet. Seven-inch casing was set at 8040 feet.

Testing Deep Sand

At North Tepetate field, Acadia Parish, Atlantic Refining Company is testing Fournerat 1 after drilling to 8547 feet with seven-inch casing set at 8048 feet. This well topped a broken formation with a show of oil at 8482 feet and cored the show to 8547 feet. Eight feet of oil sand also was cored at 7703 to 7726 feet, which corresponds to the Tepetate sand and may produce a heavier oil than has been produced in the field. It is understood that the 7703-foot horizon will be tested first.

Sid Richardson has made a second location at the new Wilcox Eola field, Avoyelles Parish. Haas Investment Company 2, a north offset to the discovery, is 260 feet south of the northeast corner of Section 7-2s-3e. The discovery well is flowing 160 barrels of pipe line oil daily through ⅛-inch choke, with a tubing pressure of 1550 pounds and a casing pressure of 1625 pounds. The well was completed in the Wilcox formation at 8550 feet.

East of production at Lake Long, Lafourche Parish, Fohs Oil Company is preparing to make another test on State Lake Long 7 after recovering 9100 feet of salt water in 30 minutes last week when casing was perforated from 9200 to 9208 feet. Cement was squeezed through perforations for another test at 9201 to 9205 feet.

North of St. Martinville field, St. Martin Parish, Continental Oil Company's Standard of Kansas 1 was drilling ahead in shale at 6710 feet. It is reported that a broken formation with a slight show of oil was cored from 5866 to 5876 feet.

The Texas Company is drilling deeper on State Lake Fausse Point 5 at Fausse Point, Iberia Parish. Last week the well was down to 10,450 feet in shale. A string of protection pipe was set below 9900 feet. The Texas Company's Horseshoe Bayou 2 at Horseshoe Bayou, St. Mary's Parish, is washing over stuck drill pipe at 10,500 feet after setting a short string of 6⅝-inch casing at 12,645 feet. After setting the pipe and while coming out of the hole, the drill pipe was stuck around 8500 feet.

A new sand was provided for the southwest side of West Hackberry, Cameron Parish, when Superior Oil Company's Benson Vincent 5 was brought in for 300 barrels through a 10/64-inch choke after perforating casing at 7800-10 feet.

SOUTH LOUISIANA
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Baton Rouge—		
William Helis, Nelson 3	405	6476
Charenton—		
St. Mary Oil Co., LeBlanc 2	200	1126
Grand Bay—		
Gulf, Grand Prairie Levee District 3	284	7141
Lake Pelto—		
Texas Co., State 22	64	5176
Jeanerette—		
Herton Oil Co., Sugars 1	• 10,347	
Sulphur—		
Union Sulphur, Fee 819 (wo)	175	4260
Venice—		
Tide Water, Manhatten Fruit Co. 9	240	5710
West Hackberry—		
Stanolind, State 36	•	4698

• Failures; † Junked; ¶ Million cu. ft. gas.

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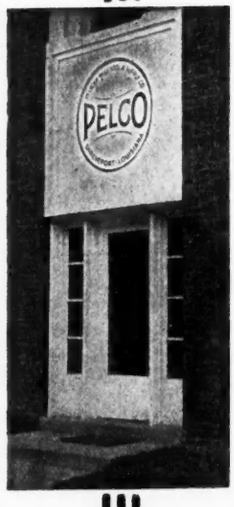

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North Louisiana Fields

Six locations for Tokio section of Pine Island.
De Soto Parish wildcat prepares to swab deep sand.

Shreveport. — Six locations were staked last week in the new north offshoot of the Tokio producing part of the old Pine Island field, Caddo Parish, near Vivian, where a half-mile north extension was made to a recent 2½-mile north extension.

Pine Island, oldest North Louisiana field, has been the scene of considerable drilling activity for stripper production in the last year because there has been no spacing rule or proration. The new rush of activity near Vivian may cause a space rule and allowable to be put in effect at least in that part of the field. A 10-acre rule and top allowable of 150 to 200 barrels appears to be the most favored figures should such rules be placed in effect.

The rush of new locations followed completion of L. H. Mahon and associates' Henderson 1, SW SW 27-22n-16w, from the Tokio flowing as high as 50 barrels per hour of 45.1-gravity oil through ½-inch choke, and later was pinched in further due to lack of storage. The well showed 0.5 percent basic sediment but no salt water. Sand was logged from 2472 to 2481 feet. It came in after only 700 feet of tubing had been run and gauge was made on this short string.

New locations announced were: Don George, Henderson 1, N 8 acres SW SW SW 27-22n-16w; M. Carl Jones, Henderson 1, S 8 acres SW SW SW 27-22n-16w; J. W. Ingram, Henderson 1, 537 N and 792 west SWc SW 27-22n-16w; Riggs and Gilger, Browning 1, NE NE SW 27-22n-16w; D. Holcomb and associates, Henderson 1, SW SW 27-22n-16w, offsetting the new well to the east; and Durham and Lee, Henderson 1, 580 west and 184 north SEc 27-22n-16w.

Two new oil wells were added from the "E" or Bodcaw sand of the lower Marine at Cotton Valley last week, bringing to five the oil wells in this horizon and coupled with four from the "D" sand make nine oil wells from the Lower Marine series of this field.

S. S. Alexander prepared to swab Stell A-1, NE NE 5-12n-16w, De Soto Parish wildcat, after perforating casing from 3004 to 3046 feet. Total depth is 3145 feet and 5½-inch casing was set on bottom. One mile southwest of its Lower Marine gas-distillate discovery well at Shongaloo, Magnolia Petroleum Company's Branton 4, C NE 6-22n-9w, cored hard sand at 9141 feet after drilling plug in 7-inch casing set on bottom at 9138 feet after electrical log was run. The same company's Roseberry Unit 1, C SE 29-23n-9w, drilled hard sand at 7754 feet. Arkansas Fuel Oil Company's Gayoso 2, C SW SE 14-16n-10w, Bienville Parish, drilled lime and shale at 6212 feet, and in Webster Parish, Union Producing Company's 9000-foot test at Sibley, Walker Unit 1, C 30-18n-8w, drilled at 7170 feet.

Two at Shreveport

Two new producers, the tenth and eleventh oil wells for the basal Glen Rose lime horizon, were completed in the Shreveport field last week. Two new locations were also announced.

Hurricane Petroleum Company's North 1, C SE NE 34-18-14, completed at 5591 feet after perforating with 24 shots from 5537-40 feet, flowed 8 barrels hourly through ¼-inch tubing choke, tubing pressure being 1375 pounds and casing pressure, 1475 pounds. Roy Kniverton's Kahn-North 1, C SE NW 35-18n-14w, completed at 5562 feet, made 33 barrels per hour through ¼-inch choke with tubing and casing pressure equalized at 500 pounds. Gas/oil ratio was 3.0001 to 1. Both these wells offset producers. The latter well is the third one to be completed inside Shreveport's city limits and is just north of the Municipal Golf Course.

The two locations were W. C. Feazell's Hunter 1, SW SW 23-18n-14w, and Lake Production Company's Herndon 1, NE SW 34-18n-14w. Both offset producers. Three other operations in the field are drilling, with an old operation re-testing, and two other operations rigging. Bad weather and roads hampered activity and made some locations almost inaccessible.

NORTH LOUISIANA Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Bienville Parish (Wildcat)—		
Producers O&G Co., Graves-Thomas 1, 23-15n-10w	*	2936
Caddo Parish (Pine Island-Vivian)—		
Mahon et al, Henderson 1, 27-22n-16w	1200	2481
R. W. Williams, Arkansas Fuel Co. 2, 26-21n-16w	75	2254
Claude Ferguson, Lawhon 3, 7-20n-15w	85	1582
Caddo Parish (Rodessa)—		
Eagle Prod. Co., Means 1, 9-23n-15w	40	6028
Caddo Parish (Shreveport)—		
Hurricane Pet. Co., North 1, 34-18n-14w	192	5591
Kniverton et al, Kahn-North 1, 35-18n-14w	768	5562
Catahoula Parish (Wildcat)—		
Sibley-Sabine Corp., W. S. Peck 1, 39-10n-8e	*	3212
Sabine Parish (Zwolle)—		
C. R. Schuster, Martha Garcia 1, 15-7n-13w	*	2603
Union Parish (Monroe)—		
Interstate Nat. Gas Co., Fee 90, 30-21n-4e	¶19	2176
Fee 91, 36-21n-3e	¶22½	2156
Webster Parish (Cotton Valley)—		
Hunt Oil Co., J. B. Sandefur 1, 4-20n-10w	288	8720
Woodley Pet. Co., J. O. Couch 1, 36-21n-10w	960	8600

* Failures; † Junked; ¶ Million cu. ft. gas.

ARKANSAS Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Miller County (Rodessa)—		
Killingsworth et al, Greer 1, 11-20-28	*	6149
Union County (Schuler)—		
Phillips, Amanda 1, 12-18-18	450	7697

* Failures; † Junked; ¶ Million cu. ft. gas.

Louisiana permits

Shreveport, La.—Twenty-two drilling permits were authorized last week by the Louisiana Conservation Commission of which 10 were in North Louisiana, divided among the following parishes: Caddo, 7; Ouachita, 1; and Sabine, 2. The 12 in South Louisiana were in the following parishes: Acadia, 1; Beauregard, 1; East Baton Rouge, 1; Evangeline, 2; Cameron, 2; Jefferson, 1; Jefferson Davis, 1; LaFourche, 1; and St. Mary, 2.

Arkansas Fields

Tenth Permian producer completing in Buckner field

El Dorado, Ark.—Expected to be the tenth Permian lime oil producer for the Buckner field, Columbia County, Standard Oil Company of Louisiana's S. T. Crone 3, SW NE SW 8-16-22, was in course of completion as last week closed. Total depth is 7267 feet and top of lime was logged at 7242 feet with final casing string set 1 foot above that point.

Two tests in the Magnolia field, Columbia County, also a Permian lime oil-producing district, were in the Permian series, these tests being Southwood Oil Corporation's J. O. Hutcherson 1, NE SW 14-17-20, at 7553 feet and Goldston and associates' A. C. Garrett 1, SE SW 13-17-20, below 7510 feet.

Shell Petroleum Corporation's and Ohio Oil Company's Warren 1, SE SE 13-16-24, Permian lime wildcat in LaFayette County, was being swabbed after use of 3000 gallons of acid, water being used with the treatment instead of oil, at plugged-back depth of 7284 feet. This test showed oil and salt water when tested at 7220 feet after casing was cemented at 7169 feet.

West of Bradley, also in LaFayette County, J. K. Wadley and associates' Taylor 1, C NE SW 15-19-26, a wildcat, drilled ahead at 6437 feet for basal Glen Rose lime after all of the Rodessa Glen Rose formations failed to show any promise aside from a slight showing in the Gloyd.

Most interesting wildcat of the week, however, was Deep Rock Oil Company's and Tide Water Associated Oil Company's A. C. Wesson 1, NE SE SE 23-15-19, Ouachita County, near Stephens, which after reaching contract depth and running electric log to 6003 feet, deepened to 6050 feet, and set 5½-inch casing at 6038 feet. What the last 50 feet contained was not revealed. Previously it was thought the water level had been established at 5980 feet.

One well, on the west edge of production was completed during the week at Schuler, Union County, where ac-

tivity continued to be at a low ebb. However, one-half mile south of production on the west side, Edwin M. Jones made location for Murphy Land Company C-1, NE NE 24-18-18.

Texarkana municipal plant contracts for gas supply

The Bennett Petroleum Company of Houston, Texas, last week was awarded a contract by the Texarkana City Council to supply the city with gas for distribution through a municipal gas plant, which is to be constructed in the near future.

The company's bid was a flat rate of 10 percent per 1,000 cubic feet on the basis of two pounds above assumed atmospheric pressure of 14.7 pounds. The contract calls for a minimum daily consumption of 500,000 cubic feet and a maximum of 5,000,000 cubic feet.

Big block assembled for Mississippi delta test

Jackson, Miss.—Ryan and Anderson, Inc., of Jackson, has assembled 30,000 acres centering around the common corner of Townships 11 and 12 north, Ranges 7 and 8 west, Sharkey and Issaquena counties, in the Mississippi delta, for a proposed 3500-foot test to start within 6 months. The Mississippi State Mineral Lease Commission leased them 9000 acres of tax-forfeited land, embraced in this block.

The State Mineral Lease Commission at its February 1 meeting deferred until February 13 awarding of drilling contracts on Mississippi coastal water land. Two bids were submitted but the commission announced it would submit a contract to the two bidders, embodying the desires of the state relative to the leasing. The bids were submitted by Westbrook, Thompson, and Stewart of Fort Worth, Texas, and by the Federal Royalties Company of Houston, Texas.

H. S. McQueen and H. L. Scott, the former of Rollo, Missouri, are planning three tests on a large block of leases they are securing in northeast Mississippi and northwest Alabama, the three tests probably to be in Lowndes and Monroe counties, Mississippi, and Lamar County, Alabama, in the general vicinity of Amory where first commercial gas in Mississippi was found in 1926. In northwest Alabama near the old shallow Fayette gas field discovered in 1910, J. W. Mills of Texas is assembling a block. In the same general area J. C. Shepherd of Berry, Alabama, recently assembled a large block.

Florida

Miami.—Peninsular Oil & Refining Company's J. W. Cory 1, C NW 6-55s-34e, in the Everglades, 41 miles west of Miami, was drilling last week at 1845 feet in lime. It is reported that J. W. Phillips Oil Exploration Company is negotiating with a contractor for figures on deepening Shilkett 1, NW NW 14-4s-14e, Suwannee County, Florida, to 8000 feet. Test is now shut down at 320 feet.

I. A. O'SHAUGHNESSY, Minneapolis, Minnesota, president of the Globe Oil & Refining Company, was in Wichita, Kansas, last week.

New Mexico Fields

Lea County sandy lime belt gets most of new work. Eunice sector of Hardy extended half mile east.

Hobbs, New Mexico.—The sandy-lime belt in the east portion of Lea County accounted for 6 of the 11 new projects authorized the past week, and two areas along this trend registered prolific extensions that will lead to more development.

The productive limits of the Eunice townsite sector of Hardy field were expanded half mile east when Magnolia Petroleum Company's Marshall 1, near C SW NW 34-21s-37e, gauged 335 barrels initial through ¾-inch tubing choke after a 160-quart nitro shot at 3674-3758 feet. Three pay zones were logged below 3640 feet. It is east of a recent completion by the company. The two wells will require more than the normal quota of offsets because of small leases.

Texas Pacific Coal & Oil Company's State 13-A, C NE NE 11-22s-36e, provided a half mile south extension for the prolific oil area that is classified as the South Eunice field for proration purposes but is nearer the Penrose field. This well flowed 60 barrels hourly natural through open tubing from pay at 3715-3800 feet. The company owns lease on the entire section, and has skidded rig one location west to drill State 14-A.

Continental Oil Company's State 4-J-2, C NE NE 2-22s-36e, gauged 51 barrels hourly natural through ¾-inch choke from 3766-3845 feet. On a previous test the well flowed 90 barrels hourly, then tubing packer was installed to lower the gas-oil ratio. Gulf Oil Corporation's State-W. A. Ramsey 4 has been started as a north offset to the latter well.

M. B. Bryant et al, who recently purchased the Republic Production Company et al's State 160-acre lease, with one well, on the west edge of the Eunice field, have made location for State 2, SE SW SE 12-21s-35e.

Gap Well Showing

An offset to an old failure drilled near the intersection of the Langlie and Mattix fields was showing for a producer last mid-week, indicating that the earlier prospecting passed up the pay with rotary. The North Shore Corporation's Woolworth 1, NE NE NW 33-24s-37e, and Woolworth 2, southeast corner of the same 160-acre site, were being completed as oil producers in the 3500-foot sandy-lime. Phillips Petroleum Company and Pure Oil Company's Woolworth 1, lease 2, C NE NW 33-24s-37e, was abandoned at 4200 feet as a failure in November, 1935. The latter partnership retained lease on the east half of the section, and recently started operations on Woolworth 6, C NE NE 33-24s-37e. In the southeast portion of the Langlie area, Culbertson & Irwin, Incorporated, and Sunray Oil Company made location for Henry 3, SW SW SW 26-25s-37e.

Repollo Oil Company's State 1-182, SW SE SW 31-16s-37e, third oil completion for the Lovington pool, Lea County, has been listed as a completion, flowing 332 barrels of 37 gravity oil in 18 hours through ¾-inch choke. Production is from broken lime at 4611-4760 feet, and required acid treatment to make a commercial well. Only one additional test has been authorized for the area, although offsets will be required shortly. The oil is transported to Hobbs by tank trucks.

Vacuum Most Active

Vacuum field is the most active drilling center in the state. Currently there are 29 operations, including 24 drilling tests. Magnolia Petroleum Company's State 4-M, C SE NW 34-17s-35e, was a standout completion the past week, having gauged 317 barrels oil natural in 7 hours through ½-inch choke from lime at 4650 feet. The gap between this somewhat prolific sector and the older portion of the field is to be developed, as the company has rigged up to drill State 1-O, C NW SW 33-17s-35e, situated on a 40-acre lease that calls for production in May. The above company's State-Bridges 26, C SE SW 26-17s-34e, recent authorization, was cementing 10-inch surface pipe at 839 feet.

Great Western Producers, Incorporated's Bordages 2, NW SE NW 33-19s-37e, east edge of the Monument field, is taking care of an offset in drilling below 1500 feet.

Allowable production for the state was raised 1800 barrels to 102,600 barrels daily for the February proration period. Lea County was allocated the gain, while Eddy County was reduced 2000 barrels daily due to shrinkage in the export crude demand. The daily allowable for Lea County was raised 2 barrels to 50 barrels, while those in Eddy County were cut 19 barrels to 45 barrels, according to C. G. Staley, proration umpire.

NEW MEXICO Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Eddy County—		
Dominion & Green Bay, Johnson 3, c ne sw 35-16s-31e	†	3950
Paton Bros. et al, Erwin 1, c se se 5-18s-31e	*	3738
Worth Drl. Co., Taylor 1, c sw sw 12-18s-31e	58	3600
Lea County (Eunice)—		
Continental, State 4-J-2, c ne ne 2-22s-36e	1248	3845
T. P. Coal & Oil Co., State 13-A, c ne ne 11-22s-36e	1440	3800
Lea County (Langlie)—		
Culbertson & Irwin, Inc.-Sunray, Henry 2, sw se sw 26-25s-37e	158	3295
Italo Pet. Corp., Carlson 1-B-27, ne nw ne 27-25s-37e	70	3364
Montecito Corp., Woolworth 1, ne se sw 33-24s-37e	2520	3545
Lea County (Penrose)—		
Twin Oil Corp., Christmas 1-C, c se ne 17-22s-37e	67	3699
Lea County (Vacuum)—		
Magnolia, State 4-M, c se nw 34-17s-35e	1336	4650
Ohio, State-McCallister 4, c nw sw 25-17s-34e	1065	4710
Phillips, State-Santa Fe 18, c nw ne 34-17s-35e	750	4550
Shell, State 2-V, c se se 27-17s-35e	636	4680
Mora County—		
Carbon Chemical Co., Mitchell 2, 20-19n-30e	¶5	2085
Stevens & Neill, State 1, 9-19n-30e	¶¾	2085
San Juan County (Rattlesnake)—		
Continental et al, Rattlesnake 85, 2-29n-19w	45	842

* Failures; † Junked; ¶ Million cu. ft. gas.

Michigan Fields

Bay County Monroe lime test yields 178 barrels

Mt. Pleasant, Mich.—Gulf Refining Company's Bateson 1, Section 2-14n-4e, Monitor Township, Bay County, first test of the Monroe lime horizon in the district, flowed and swabbed 178 barrels on a 23-hour test after a 1000-gallon acid treatment last week. Tests indicated that the packer used to plug back from 3755 to 3550 feet may have been set too high and as a result shut off some of the potential pay. Testing was to be continued the rest of this week before final decision was expected as to whether or not it will complete in the Monroe or go to the Sylvania.

Two new locations were reported in the Monitor Township district this week. Meanwhile, 20 miles east of this development in Tuscola County, where the first commercial strike in the deep Monroe beds was made in early 1938 by Norton and Kramer, and one offset producer has since been completed, two new tests are rigged for immediate drilling. The Tuscola wells produce from the same formation at about 3430-70 feet.

Commercial importance of an oil show logged last week in the Trenton limestone had not been determined up to this week in Berrien County, extreme southwest tip of Michigan, where Sprenger Brothers' Bihlmire 1 wildcat, Section 35-3s-17w, is bottomed to case and test at 2268 feet, 33 feet in the Trenton zone.

Kent County is almost certain to get a good drilling play before spring as the result of recent developments on the offset to the discovery. Smith Petroleum Company's Whalen 1, Section 32-7n-12w, Walker Township, initialed 320 barrels natural in Traverse limestone at 1829½ feet. Acidized this week production went up to 40 barrels an hour. Three tests already are drilling and five new locations were reported staked. This play is only three miles west of the city of Grand Rapids, and is expected to provide another townlot drilling problem by summer. Attempts already are being made to communitize in several areas.

Casing seat was lost forcing reaming and re-cementing when an attempt was made this week to acidize Bell & Marks, Inc.'s Brower 1, Section 23-3n-12w, Hopkins Township, Allegan County wildcat. The well is producing from Traverse limestone at 1639½ feet and has flowed and swabbed as high as 114 barrels in 14 hours.

MICHIGAN
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Allegan County—		
Willard Wyse, Giles 1, sw sw nw 9-1n-14w	*	1360
Michler et al, Harlan 1, nw nw nw 27-1n-12w	*	1394
Fortney & Cooks, Hoeve 1, nw se nw 27-4n-14w	325	1462
Muskegon, Miller 1, se ne ne 10-4n-13w	*	1655
M. L. Jorgensen, Weber 1, ne se ne 10-4s-13w	*	1650
American Drl'g, Sindlinger 1, nw se nw 11-4s-13w	150	1608
Clare County—		
Pure, Austin A1, sw sw se 27-19n-6w	200	3891
Davis 1, c n ne ne 33-19n-6w	2000	3889
Clinton County—		
C. P. McDonald, Koeppen 1, c s se se 19-6n-3w	*	2990
Gladwin County—		
Rose & Jones, State A3, sw nw se 20-17n-2e	25	3536
Isabella County—		
Ogo Oil Co., Callison 1, nw sw nw 35-16n-3w	*	3775
Jackson County—		
J. V. Wicklund, Silence 1, se nw ne 31-3s-2e	*	1810
Kalamazoo County—		
Premier Oil Co., Harper 1, ne nw sw 26-4s-10w	*	1340
Montcalm County—		
American Production, Sack 1, c ne 27-12n-6w	¶12½	1318
St. Clair County—		
Huronic Oil Co., May 1, sw sw nw 4-7n-17e	*	648
Van Buren County—		
W. E. Dotson, Rogers 1, se nw sw 8-1s-14w	200	1224
Fisher & McCalls, Wiggins B3, sw se sw 9-1s-14w	400	1223
Jetter Drlg. Co., Hense 1, se ne nw 14-1s-14w	40	1322
Clark & Johnsons, Maier 2, ne nw se 14-1s-14w	110	1280
Brouch & Fosters, Schock 1, nw ne nw 15-1s-14w	*	1307
Bloomingdale, Merrifield 1, sw sw nw 16-1s-14w	90	1220
Wiser Oil Co., Boyers 5, se se nw 17-1s-14w	40	1240
Bridger Basin, Cominsky 4, sw se ne 17-1s-14w	1000	1209
D. F. Jones, Fox 1, nw ne se 11-1s-15w	10	1225
Lacota Oil Co., Bidenkopf 1, nw sw se 2-1s-16w	*	1310
Dr. V. Kirkham, Hofacker 1, se se nw 35-1s-13w	*	1316

* Failures; † Junked; ¶ Million cu. ft. gas.

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California Fields

May test Buttonwillow project near 11,506 feet.

Kern County wildcat negotiates basalt stratum.

Los Angeles.—California Exploration Company's Salisbury 1, Section 7-29-24, a wildcat on the south dome of Buttonwillow Ridge, Kern County, has reached 11,506 feet and reports are that casing will be set for a production test, drilling having stopped in a shale body classified as that which overlies the Stevens sand in the Ten Sections field. Drilling of this test has been hampered by caving shale, long a problem in this area.

Petrol Corporation's Reserve-Petrol 33-5, at the foot of the Grapevine, 30 miles south of Bakersfield, in Kern County, in drilling to 7900 feet passed through a hard stratum of basalt which previously has discouraged operators. The basalt was topped at 6915 feet after passing through thin stringers of oil sand between 6700 and 6800 feet. Tide Water Associated Oil Company's S. P. 2, Section 15-11-19, in this area, stopped coring at 7326 feet in dark shale, plugged back to 6790 feet and set casing at 6650 feet to test oil showings between 6650 and 6790 feet.

Semi-Wildcat Yields Gas

Hall-Baker, Inc., has completed Williams Permit 1, Section 2-30-21, semi-wildcat in the McKittrick area, for a million cubic feet of gas and no oil from 2493 feet. The Franco-Western zone was found barren.

Doyle Petroleum Company is completing derrick for its third test on the Quinn Ranch in the Jasmine district, near Delano in Kern County. Location is in Section 15-26-27, north of the two previous tests, neither of which developed anything of interest.

Rincon Development Company is making repairs to the "steel island" offshore from the Seacliff field, Ventura County, preparing to drill another well. The platform was constructed seven years ago and three wells have been drilled from the one location.

Long Beach Harbor Commission recently rescinded an award granted to W. R. Ramsey, Oklahoma operator, for development of 270 acres of the commission's holdings with the understanding that the city would receive 60¼ percent royalty.

Petroleum engineers estimated the parcel would yield upwards of 50,000,000 barrels of oil.

CALIFORNIA
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Los Angeles County—		
Union, Howard & Smith 4, 573 ft ely on C/L Beverly Blvd. from C/ Maple; thence 510 ft nly at rt angles	606	6680
Texas Co., W. B. Baldwin 6, 310 ft wly on s line of lot 3, tract 1664 from se c, thence 200 ft nly at rt. angles	39	6844
Bolling Oil Co., Power 1, 105 ft n and 84 ft w of 700 nwc of 237th St. and Walnut	700	5165
Huntington Signal Oil Co., Clark 1, 70 ft n and 95 ft e of C/Ls 236th St. and Eshelman	380	5141
Pacific Western Oil Co., Marble Fee 13, 470 ft s on e ppty line from C/L Sepulveda; thence 900 ft wly at rt angles	340	4939
Tiger Oil Co., No. 1, 171 ft n and 556 ft e of C/Ls 236th St. and Eshelman	300	5139
Richfield, Pacific Dock (LB) 31, 550 ft sly on e ppty line from nec; thence 980 ft wly at R/A	252	3176
Union Pacific, U. P. (LB) E-12, 2250 ft sly on C/L Henry Ford Ave from C/L Anaheim; thence 4826 ft ely at R/A	263	3619
Orange County—		
Shell, Irvine 3, 2743 ft due n and 421 ft due e from sly c blk 96, Irvine Subdivision (W)	*	1826
Kern County—		
Standard, Flo Fee 1, 330 ft n and 330 ft e of swc of sec 12-30-25	443	8280
No. 30, 660 ft s and 220 ft w of nec of sec 7-20-22	76	2202
Shell, Freeman 21, 429 ft n and 2386 ft e of swc of sec 20-28-29	51	1915
A. Fuhrman, No. 11A, 700 ft n and 1090 ft e of c of sec 28-28-28	*	635
Fresno County—		
General, Esperanza 103, 1310 ft s and 1022 ft w of c of sec 6-20-15	20	1318
Section 30 Oil Co., No. 5, 100 ft n and 600 ft w of sec of sec 30-19-15	400	1553
R. S. Lytle, No. 71-18F, 330 ft s and 990 ft w of nec of sec 18-20-16	3615	8034
Standard, No. 1-17F, 330 ft s and 330 ft e of nwc of sec 17-20-16	2335	8015
Kings County—		
Standard, No. 46-13H, 1650 ft n and 2310 ft e of swc of sec 13-21-16	*	11,030

* Failures; † Junked; ¶ Million cu. ft. gas.

Mountain States

Good flows indicated for Lance Creek edge well

Casper, Wyo.—Another good Leo sand well is in prospect for the eastern edge of the Lance Creek field, Niobrara County. Ohio Oil Company's Leo 6 OPC-16, NW NE SW 35-36n-65w, tested 93 barrels of oil hourly from the second Minnelusa sand at 5576 feet. Operators have cemented 7-inch casing on top of the formation at 5530 feet and are cleaning out and testing to complete. Continental Oil Company's Apex-4 3, SE SW NW 35-36n-65w, topped the objective Leo horizon at 5449 feet and drilled to 5478 feet in saturated sand. seven-inch casing was cemented at 5451 feet in the top of the formation and operators are waiting on cement to set before drilling in for an official test.

A production test is being run on the Osage Trust Company and T. R. Ragland's 1, NW SW 31-42n-60w, northwestern extension test of the Dewey Dome field, in Weston County, northeastern Wyoming. Location is 1 mile north and west of Conway Oil Company's discovery well for the field completed in 1937 for 40 barrels initial. Hole bottoms at 2502 feet in saturation reported in the Leo sand formation of the Minnelusa series.

The California Company and Ohio Oil Company are testing production in Union Pacific-Johnson 7, CS NE SW 23-21n-79w, in the jointly operated Big Medicine Bow field, Carbon County, southern Wyoming. Well bottoms at 5385 feet in the base of the Dakota to which it plugged back after failing to find commercial oil or gas production in the Sundance sands at 5836 feet.

Continued deepening and testing at 5-foot intervals is being carried out in Sinclair-Wyoming Oil Company's Lost Soldier 81, SE NW 11-26n-90w, drilling in the Lost Soldier field, Sweetwater County, southwestern Wyoming. Hole has been drilled to 2059 feet where operators are testing further. Producing sand in the well is the Sundance formation.

The Taylor Oil Company's Sheets-Government 1, SE NE SE 9-55n-96w, drilling as a south extension test of the Byron field, in Big Horn County, northern Wyoming, is shut down temporarily at 3430 feet. Location of the well is on the southeastern fault block in a hitherto untested sector of the field.

A new location has been spotted on the southeastern edge of the Lance Creek field, in Niobrara County, by Minnelusa Oil Corporation. Well No. 1 H & M on Lease 5, will be drilled in NW NE SE 7-35n-65w.

In Converse County, east central Wyomnig, Blue Ridge Oil Company's Prokesh 1, SW NW SE 29-32n-69w, has cemented 10-inch casing on bottom of the hole at 330 feet and is waiting on cement to set before drilling ahead.

Indiana has 20 percent increase in drilling

A 20 percent increase in oil and gas drilling was registered in Indiana during 1938, according to Commissioner Virgil M. Simmons of the State Department of Conservation. Completions numbered 162, compared to 134 in 1937.

"Ninety of the 162 wells drilled were producers, while 120 were drilled in proven areas and 42 were in wildcat territory," Simmons said. "Forty-nine oil and 41 gas wells were completed during the year, with 72 non-producing wells.

"It is anticipated that 1938 will see a considerable increase in drilling activities, especially in the southwestern part of Indiana," Simmons added.

MOUNTAIN STATES
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
MONTANA		
Toole County (Kevin Sunburst Field)—		
Big West Oil Co., Gunderson 1, nw se nw 19-35n-2w	168	1654
H. Kluth et al, Gunderson 2, sw sw sw 18-35n-2w	10	1675
Superior, Gov't 11, e nw sw 12-35n-3w	11	1524
WYOMING		
Niobrara County (Lance Creek Field)—		
Ohio, Lamb 3, swc se se 32-36n-65w	¶1/3	3212
Weston County (Osage Field)—		
Bert Higgins, 7, ne ne se 5-46n-63w	2	385
Selby & Langford, 1, cnl sw ne 6-46n-63w	2	545

* Failures; † Junked; ¶ Million cu. ft. gas.

WILDCAT REPORT
New Starts and Completions

STATE	WILDCATS STARTED		WILDCAT TESTS COMPLETED							
			Total		Oil		Gas		Dry	
	This Week	This Year	This Week	This Year	This Week	This Year	This Week	This Year	This Week	This Year
Alabama	...	1	...	1	...	...	...	...	...	1
Arkansas	...	2	...	...	...	...	...	...	...	...
California	5	36	...	13	...	7	...	...	...	6
Illinois	4	43	6	19	1	3	...	...	5	16
Indiana	1	4	...	...	...	...	...	...	...	...
Kansas	3	22	4	16	1	6	...	...	3	10
Kentucky	...	1	2	2	1	1	...	...	1	1
Louisiana	...	15	2	12	...	2	...	...	2	10
North Louisiana	...	5	2	5	...	...	...	...	2	5
South Louisiana	...	10	...	7	...	2	...	...	...	5
Michigan	6	22	9	31	...	...	...	...	9	31
Mississippi	...	...	...	1	...	...	...	...	...	1
New Mexico	1	1	...	1	...	1	...	...	...	...
New York	...	...	1	2	...	...	...	1	1	1
Oklahoma	3	20	3	19	1	3	...	1	2	15
Ohio	...	...	1	2	1	1	...	...	...	1
Texas	21	108	21	101	1	10	...	1	20	90
East Texas	...	7	2	9	...	...	...	...	2	9
North Texas	5	6	4	20	...	6	...	1	4	13
Gulf Coast	4	17	2	9	...	1	...	...	2	8
Panhandle	...	1	1	1	...	...	...	...	1	1
South Texas	8	51	8	48	1	3	...	...	7	45
West Texas	4	26	4	14	...	...	...	...	4	14
Total U. S.	44	275	49	220	6	34	...	3	43	183

CALIFORNIA
FIRST REPORTS

Kern County—Amalgamated Oil & Gas Co.'s Wallace 1, 330 ft n and 330 ft w from e¼c 23-24-27, lcn. Hogan Petroleum Co.'s Zabala Core Hole 1, sw¼ 33-8-34 (nwc of Zabala Ranch), lcn. S. M. Newton's Stafford 1, 990 ft n and 990 ft e of s¼c 18-31-21, elev 2260 ft, ru cable tools.

Santa Clara County—Homer Hatcher's No. 1, 1000 ft n and 1200 ft w from nec sec 8-9s-1w, elev 600 ft, lcn.

Santa Cruz County—Joseph Faria, Jr.'s No. 1, 660 ft s and 330 ft e of c of sec 12-11s-3w, lcn.

COMPLETIONS

Orange County—Shell Oil Co.'s Irvine 3, 2743 ft n and 421 ft e from sly c blk 96, Irvine subdivision, elev 306 ft, abnd 1826 ft.

ILLINOIS
FIRST REPORTS

Clark County—Harry Dunn et al's Medsker 1, c ne ne 7-9n-12w, rig.

Perry County—G. H. Blakenship's Rheinnesker 1, nw ne 3-6s-4w, moving in materials.

Wayne County—Edward H. Held and Kingwood Oil Co.'s Gibbs 1, nw nw sw 11-1n-9e, southeast of Clay City and 5 miles southeast of Riggs field, moving in materials.

White County—J. W. Pearson's T. E. Boultinghouse 1, 9-4s-10e, between Grayville and Crossvile, dk.

COMPLETIONS

Edwards County—Owens & Kinney's Ira B. Hansen 1, nw nw se 20-1n-14w, abnd 3404 ft.

Jefferson County—Benedum-Trees Oil Co.'s Interstate Coal Co. 1, ne ne sw 9-4s-2e, Elk Prairie tnp, top Devonian 4265 ft, abnd 4422 ft.

Marion County—Adams Oil & Gas Co.'s Hoffman 1, nw se sw 27-2n-2w, no oil at any depth, abnd 1437 ft.

Washington County—American Seismograph Co.'s M. Leibrock 1, nw nw nw 24-3s-3w, Pilot Knob tnp, top Aux Vases 1305 ft, abnd 1473 ft.

Wayne County—Carl Robinson's D. K. Felix 1, sw se se 27-2s-8e, Barnhill tnp, 4 mi southeast of Fairfield, blew in at 70 barrels an hour, shut down with storage full, top McClosky 3390 ft, td 3410 ft, St. Louis Syndicate's McLane 1, c nw se se 10-1s-6e, Berry tnp, top Benoist 2972 ft, top St. Louis 3247 ft, abnd 3300 ft.

INDIANA
FIRST REPORTS

Spencer County—W. W. Damron's C. Niles 1, ne nw 2-8s-7w, 2 mi northeast of Enterprise and 5 mi southwest of Rockport, to test McClosky, dr 250 ft.

KANSAS
FIRST REPORTS

Leavenworth County — Hardaway et al's Scheller 1, sw se sw 30-10-22e, dr.

Rooks County—Broadview Oil Co.'s Beardsmore 1, nw se sw 2-9s-16w, rur.

Russell County—Central Petroleum Co.'s Karst 1, sw ne sw 21-15-13w, pits.

COMPLETIONS

Ellis County—Carlock's Philip 1, se sw ne 10-15-17w, 7 mi e Ruder pool, top Anhydrite 1050 ft, top Ft. Riley 2015 ft, top Neva 2360 ft, top Lansing 3028 ft, top Conglomerate 3445 ft, top Arbuckle 3475 ft, hfw, abnd 3520 ft.

Greenwood County—Turner et al's Black 1, se ne nw 3-27-13e, 1½ mi e of Brinegar pool, top Mississippi 1590 ft, top Arbuckle 1890 ft, hfw 1895 ft, abnd 1895 ft.

Rice County—Cities Service Oil Co. et al's (Communitized) DeWitt 1, csl ne 33-19-9w, e of Campbell pool, top Lansing 2859 ft, top Arbuckle 3174 ft, so 3181 ft, td 3195 ft, 1540 barrels of 49 gr, completed.

Rooks County—Producers' Ham 1, swc nw 25-7-19w, 5 mi ne Webster pool, top Topeka 2810 ft, top Lansing 3043 ft, top Conglomerate 3329 ft, top Arbuckle 3350 ft, abnd 3372 ft.

KENTUCKY
COMPLETIONS

McLean County—Fred Phillips' J. E. Arnold 1, 2 mi west of Livia, abnd 2200 ft.

Muhlenberg County—Fred Phillips, Shearn Coal Co. 1, se sw lot 7, Shearn blk, northeast of Belton, McClosky top 1536 ft, flowed 150 barrels of 47.5 gravity oil, 1541½ ft.

NORTH LOUISIANA
COMPLETIONS

Bienville Parish — Producers O&G Co., Graves-Thomas 1, SEc SW SE 23-15n-10w, elev 292 ft, top Nacatoch sand 1228 ft, abnd 2936 ft.

Catahoula Parish—Sibley-Sabine Corp., W. S. Peck 1, sec 39-10n-8e, abnd 3212 ft.

MICHIGAN
FIRST REPORTS

Allegan County — Detroit-Allegan's County Farm 1, 5-2n-13w, dr 76 ft. Muskegon's Dykhuis 1, 15-4n-15w, machine.

Berrien County—Sprenger's Bihlmire 1, testing.

Kent County—Wolverine's Orlik 1, 5-6n-12w, rig.

Mecosta County—Gulf's Klienfilter 1, 22-15n-9w, rig.

Ogemaw County—Weber's State 1, 23-24n-1e, rig.

COMPLETIONS

Allegan County—Willard Wyse's Giles 1, sw sw nw 9-1n-14w, abnd 1360 ft. Michler et al's Harlan 1, nw nw nw 27-1n-12w, abnd 1394 ft.

Clinton County—C. P. McDonald's Koeppen 1, c s se se 19-6n-3w, abnd 2990 ft.

Isabella County—Ogo Oil Co.'s Callison 1, nw sw nw 35-16n-3w, abnd 3775 ft.

Jackson County—J. V. Wicklund's Silence 1, se nw ne 31-3s-2e, abnd 1810 ft.

Kalamazoo County—Premier Oil Co.'s Harper 1, ne nw sw 26-4s-10w, abnd 1340 ft.

St. Clair County—Huronic Oil Co.'s May 1, sw sw nw 4-7n-17e, abnd 648 ft.

Van Buren County—Lacota Oil Co.'s Ridenkopf 1, nw sw se 2-1s-16w, abnd 1340 ft. Dr. V. Kirkham's Hofacker 1, se se nw 35-1s-13w, abnd 1316 ft.

NEW MEXICO
FIRST REPORTS

Quay County—N. H. Martin & Son, Doaks 1, c se nw 3-9n-31e, lcn.

NEW YORK
COMPLETIONS

Steuben County—Van Gelder et al's F. Farnham 1, Addison tnp, top Onondaga 3915 ft, top Oriskany 3937 ft, salt water in Oriskany, 3986 ft.

OKLAHOMA
FIRST REPORTS

Oklahoma County—Eldridge's White 1, c ne ne 30-11n-1e, dr.

Pottawatomie County—Pitts' Billington 1, nwc se 8-7n-5e, lcn.

Seminole County—Woodson's Goodrich 1, ne sw se 14-5n-5e, lcn.

COMPLETIONS

Jackson County—Lippert et al's Howard 1, ne sw nw 10-3n-19w, 16 mi n Tipton pool, in Granite Wash at 1675 ft, abnd 1675 ft.

Jefferson County—Bridwell Oil Co.'s Seay "I," 1, 1 mi n Oscar pool, se ne sw 29-6s-5w, td 1519 ft, completed for 14 barrels.

Pontotoc County—Casey's Pace 1, swc ne 10-3n-19w, e of North Fitts pool, hole full water, abnd 1614 ft.

OHIO
COMPLETIONS

Coshocton County—Robinson et al's Ray Carl, nw sec 22, Perry tnp, top Clinton 3087 ft, 30 bbls after shot, 3097 ft.

EAST TEXAS
COMPLETIONS

Morris County—V. A. Hughes & Co.'s Eugene Hall 1, 600 ft out of nwc of 177½-acre tract, L. Jordan sur, top Saratoga 2366 ft, Pecan chalk 2605-3015 ft, abnd 4314 ft.

Rusk County—John Wiley, Trustee's (Ham & Boggess), Ash Griffin 1, 330 ft s and 3000 ft s of M/N/nec of John Randolph sur, 3 mi s Minden, Pecan chalk between 2690-2720 ft and base 2970 ft, top Austin chalk between 3413-43 ft, top Georgetown lime between 3593-98 ft, abnd 3631 ft.

TEXAS PANHANDLE
COMPLETIONS

Collingsworth County — J. D. White & Knoll's E. Wischkaemper 1, c se H&GN sec 58, blk 16, elev 2237 ft, shot 235 qts nitro 2135-2237 ft, abnd 2377 ft.

WEST TEXAS
FIRST REPORTS

Borden County—Continental Oil Co.'s L. S. Munger 1, swc T&P sec 38, blk 41, T-4-N, lcn.

Gaines County—Osage Drl. Co.-A. S. Everest's Dr. E. H. Jones 1, c se nw PSL sec 20, blk A-7, mim.

Jones County—F. E. Stanton et al's W. S. Steen 1, 802 ft fr n and 1409 ft fr e lines T&NO sec 16, blk 1, cem sur pipe.

Pecos County—Geo. T. Abell et al's O. W. Williams 1, 330 ft fr se and 2310 ft fr ne lines H&TC sec 11, blk 3, mim.

COMPLETIONS

Jones County—R. B. Farris et al's B. D. Doty 1, 1300 ft fr n and 1200 ft fr w lines of s-169-acres of 369-acre tr, Wm. T. Evans sur No. 1, trace oil 1653-60 ft, abnd 1745 ft.

Pecos County—Wasomes Oil Co.'s B. D. Young 1, 990 ft fr nw and 2310 ft fr sw lines H&GN sec 33, blk 10, sul w and abnd 1813-64 ft.

Taylor County — Rowan-Nichols Oil Co.'s W. W. Martin 1, 466 ft out of nec lot 29, Jose M. Saucedo sur, top Dothan 1908 ft, top Saddle Creek 2270 ft, abnd in coal 2410 ft. Tal-Vez Oil Co.'s A. L. Lindsey 1, 1170 ft fr s and 220 ft fr w lines sub-div 22, Guadalupe C.S.L. sur, Leagues 120 and 121, abnd 2404 ft.

NORTH TEXAS
FIRST REPORTS

Archer County—E. P. Griffin et al's W. T. Waggoner 1, se se se H&TC sec 3, blk 4, 1½ mi w Dundee, mim for 5250-ft test.

Cooke County—Means & Howard's W. T. Lynch 1, 1075 ft fr n and e lines of A. Edminston sur, A-353, 3½ mi n Woodbine, lcn for 4850-ft test. Fred Snuggs et al's A. L. Lewis-The Texas Co. 1, 1475 ft fr n and 150

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ft fr e lines of tract, I&GN sur A-1615, 2½ mi se Bulcher, dr 650 ft.

Grayson County—Ross & Marshall's J. N. Taylor 1, 550 ft fr n and 830 ft fr e lines of W. Moore sur, 3 mi n Pottsboro, lcn.

Hardeman County—Norris-Gilbert & Co.'s V. H. Weekley 1, H&TC sec 85, blk 16, lcn for 4000-ft test.

COMPLETIONS

Archer County—Bridwell Oil Co.'s H. Harrison 1, 450 ft fr n and 200 ft fr e lines sec 7, blk 5, Clark-Plumb sur, Gunsite lime 1038-40 ft, trace oil 1065-68 ft, abnd 1120 ft. S. H. Fagadau et al's Anna Abercrombie 2, 2250 ft fr e and 438 ft fr n lines of W. Hassell sur A-775, Gunsite lime 1183-85 ft, trace oil 1240-43 ft, abnd 1302 ft. W. B. Omohundro et al's T. B. Wilson 1, 900 ft fr n and 330 ft fr e lines H&TC sec 5, blk 3, A-202, top K-M-A lime 3824 ft, top hard blue shale 4102 ft, abnd 4450 ft.

Cooke County—H. W. Caudle et al's E. E. Walker 1, H. Gilman sur A-412, Trinity series 570 to 1547 ft, top Speckle lime 1841 to 1860 ft, top Ellenberger 4040 ft, abnd 4383 ft.

SOUTH TEXAS

FIRST REPORTS

Guadalupe County—John H. Hueners Oto C. Boecker 1, 330 ft n line and 330 ft e line of 317-ac tr, John Baker survey, lcn.

Hidalgo County—Ben H. King's Oscar Dascam 1, 2106.5 ft w line and 301 ft s line of lot 10, B. H. King re-subd of blk 40, Daskam subd, Miguel Cano porcion 45, lcn.

Jim Hogg County—A. W. Dillard's Ramirez 1, 330 ft n line, 330 ft e line of 513-ac tr, sh 5, Lassater Partition, John S. Williams survey No. 27, Ab. 344, lcn.

Jim Wells County—F. A. Gillespie and Son's Shear 1, 466 ft due e of hiway and 466 ft n of s line of AB&M survey, Ab. 16 and in blk 24 AB&M subd, lcn.

Karnes County—Ike Howeth's W. J. Porter 1, 330 ft n line and 330 ft e line of 80-ac tr, Ramon Musquiz survey, lcn.

Live Oak County—Bruce Albright's First Texas Joint Stock Land Bank 1, 330 ft n line, 330 ft w line, lot 38, J. Poitevent survey 19 Ab. 348, lcn.

Medina County—Clopton and Mitchell's Mrs. T. A. Wilson 1, 750 ft s line, 5500 ft w line of W. P. Scott survey No. 509, lcn.

Nueces County—O. W. Killam's Chapman 1, 100 ft e line, 467 ft s line section 106, Laureles farm tracts, Ramon de Ynojosa grant, lcn.

COMPLETIONS

Bee County—Chapman Minerals Corp.'s J. B. Ablinger 1, 560 ft nw line, 330 ft ne line of 109.65-acre tract, John Ryan A-63 survey, sand at 5850-70 ft; shale 5980-83 ft, abnd 6013 ft.

Bexar County—David M. Stiles' Scherrer 1, 660 ft e line of tr, 660 ft n of Medina River (s line) Jose Antonio de la Garza grant, abnd 1077 ft.

Caldwell County—S. T. Dudley's Becker 1, top chalk 701 ft, top Eagleford 907 ft, top Buda 929 ft, top Del Rio 930 ft, top Georgetown 1025 ft, top Edwards 1085 ft, abnd 1117 ft.

Duval County—Interstate Minerals, Inc. et al's Milano Land & Garden Co.'s 1, 990 ft n'ly line, 990 ft e'ly w line survey 85, abnd 2903 ft. Magnolia Petroleum Co.'s Duval County Ranch 2 (101), 330 ft n line, 330 ft e line of block 7, league 101, Duval County School Lands, abnd 2765 ft.

Gonzales County—L. J. Sorrell and A. J. Mitchell's A. L. Culpepper 1-A, 480 ft nw line and 480 ft sw line of 1168-ac tr, Peter Wynn survey, junked 2865 ft.

Guadalupe County—John H. Huener's Mrs. Alwina Bauer 1, 330 ft ne line, 930 ft nw line of 300-ac lse, H. E. Brown survey, top Navarro 230 ft, top chalk 1360 ft, top Eagleford 1470 ft, abnd 1462 ft.

Live Oak County—Alvin Brauer, R. P. Holland and E. H. Smith's H. M. Bonham 1, 330 ft n line and 330 ft e line of blk 3009, sec 59, Dr. C. F. Simmons Farm-lots subd, top Chernoskey 1276 ft, sand 1390-97 ft, pumped 50 bbls 22 hrs, td 1397 ft.

TEXAS GULF COAST

FIRST REPORTS

Chambers—Navarro's Koch 1, Winnie area, center of w2 n2 e2 of blk 17, Koch subdivision, E. Lopez sur, abst. 37, lcn.

Grimes—J. H. Coker's Freund 1, Carlos dome, 600 ft n of Holt et al's Greer 1, 22 acre tract in P. B. O'Connor sur, lcn.

Harris—Hargrove and Hunter's Griffith 1, Mt. Houston area, 500 ft nw of J. Frazier's Griffith 1, lcn, Cron & Gracey's McDonald 1, 330 ft from the n and e line of 46 acre tract in A. Lawson sur, dk.

Wharton—Helmerich & Payne's Myatt 1, w of Davenang, in southeastern portion of E. T. R. R. No. 99, lcn.

COMPLETIONS

Austin—Crown Central's Heubner 1, w of Bellville, R. Stolz sur, Hockleyensis 2790 ft, Cockfield 3660 ft, salt water sand 3853 ft, abnd 4004 ft.

Grimes—Holt et al's Greer 1, Carlos area, P. B. O'Connor sur, abnd 2761 ft.

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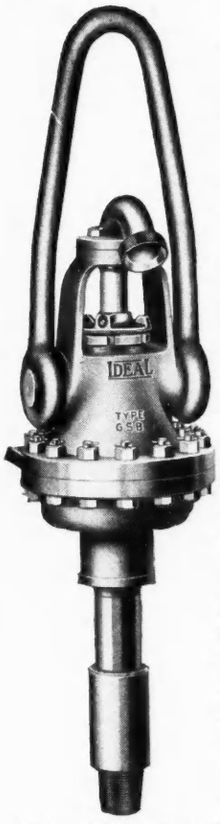
THE NATIONAL SUPPLY COMPANY

The National Supply Company has recently introduced an improved design of its Ideal 4-inch Type "GS" Swivel. This new Swivel is designated as the 4-inch Type "GSB" and is offered for moderate depth drilling where a light weight low cost swivel is desired.



National Four-Inch Type "GSB"

The main bearing of the swivel is of the cone roller type and operates in an oil bath. An improved feature is the tapered roller bearing mounted above the main bearing, which takes both the radial load and the up-thrust.

Elimination of packing problems is assured by the use of automatically adjusted packing for the wash pipe stuffing box and the lower body stuffing box. Packing off of the sleeve at the bottom of the body is accomplished by two oil seals. The wash pipe packing is Ideal V-Ring Type Packing which provides a positive seal against leakage.

The "GSB" Swivel has a 2¼-inch diameter weldless forged steel bail which is attached to 3⅜-inch diameter trunnions that are formed integrally with the upper half of the two-piece body. The sleeve has a 2-inch diameter fluid passage, and has a tapered thread at the lower end to accommodate the coupling.

This swivel can be furnished with a bracket for mounting a rubber bumper against which the elevator links may rest, a feature which reduces wear on the links.

Pump Jack

ALLIED STEEL PRODUCTS CORPORATION

Allied Steel Products Corporation, Tulsa, announces a welded steel straight-lift underpull pumping jack for which the manufacturer claims absolute straight lift by means of three centers of adjustment: the beam assembly may be aligned with the center of the polish rod by movement between the saddle bearings and the frame table; the horse head casting is carried in a cradle block on the beam which allows side-to-side movement and rotation; and two independent lines are used and by means of steel wedges and screws, equal loading may be obtained and uneven stretch in the wire lines is taken care of.

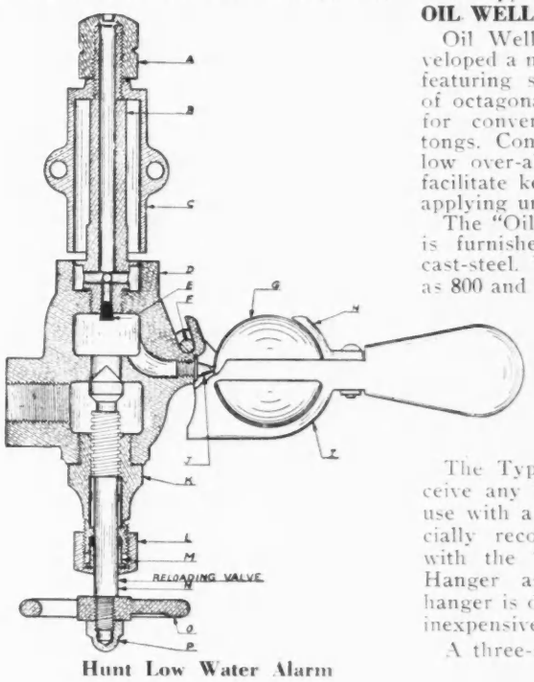
The jack is equipped throughout with non-metallic bearings.

Low Water Alarm

HUNT TOOL COMPANY

The Red Top Low Water Alarm, manufactured by Hunt Tool Company, Houston, Texas, is a safety device for use on boilers, to warn the fireman that the water level is too low. The alarm is designed with an opening directly through the body and whistle valve stem, from boiler to atmosphere.

A metallic fuse plug inserted in this opening acts as a valve for the whistle. As steam replaces water around the plug, the plug melts, allowing whistle to blow until fireman closes reloading valve. After boiler has been filled to the proper height, the reloading plug is inserted in valve stem by unscrewing the whistle. Automatic fuel cut-off valves may be installed in conjunction with this valve, the manufacturer states.



Hunt Low Water Alarm

Casing Head

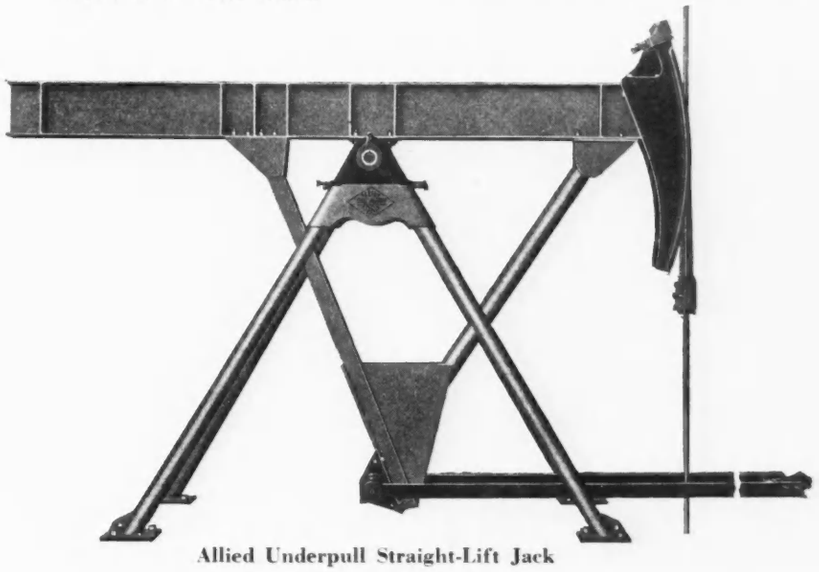
OIL WELL SUPPLY COMPANY

Oil Well Supply Company has developed a new, inexpensive casing head featuring several improvements. It is of octagonal shape with straight sides for convenience in making-up with tongs. Compact construction provides low over-all height. Eight set screws facilitate keeping the packing tight by applying uniform pressure.

The "Oilwell" Type 38 Casing Head is furnished in both semi-steel and cast-steel. Working pressures as high as 800 and 1600 pounds per square inch are permissible for the semi-steel and cast-steel heads, respectively (provided the load on the tubing hanger is sufficient to prevent leakage at the packing).

The Type 38 Casing Head will receive any tubing hanger designed for use with a common head, but is especially recommended for combination with the "Oilwell" Type 36 Tubing Hanger as illustrated. This tubing hanger is described as safe, simple and inexpensive.

A three-segment, hardened-steel slip



Allied Underpull Straight-Lift Jack

REED'S 'B-R'
DRILLING BIT WITH
WIRE LINE RETRACTABLE
CORE BARREL

HARD FORMATION HEAD (Interchangeable with Soft Formation Head)

REED 'B-R' Drill Collar and 3-Blade Drilling Bit with Core Barrel in position

REED
ROLLER BIT CO.

DRAGON COMPOSITION CUPS

Users Know Dragon Valve and Pump Cups are Built for the "Longer Run"

Dragon Composition (for deep wells); Nobs Composition (for shallow), and Dragon Leather Cups save **profits, lost time** and **headaches,** because they perform longer—more dependably. Specify "Dragon"—built by cup specialists, since 1912.

"On Duty or in Competition—as Fearless as the Dragon"

The Dragon Mfg. Co.
Marietta, Ohio

NOBS COMPOSITION CUPS

NOTES FOR THE Equipment Buyer and User

"Oilwell" Type 38 Casing Head

assembly holds the tubing securely and without crushing. A spring encircling the three segments assures proper contact with the tubing before the taper of the slips and the bowl-shaped slip body becomes operative. The slip body rests on the packing element and utilizes the weight of the tubing string for compressing the packing.

The packing element is designed for both sealing effectiveness and installation convenience. It consists of top and bottom steel rings, split in halves, and a one-piece rubber ring, split diagonally.

The Type 36 Tubing Hanger is described in "Oilwell" Bulletin No. 166. Bulletin No. 196 covers the Type 38 Casing Head.

Hand Feed Adapter for Die Heads

LANDIS MACHINE COMPANY

Landis Machine Company, Waynesboro, Pa., announces a new type sliding adapter to better effect the application of Landmatic heads to heavy-duty turret lathes.

This new adapter not only permits of a floating action for the die head but also provides a gear mechanism for starting the die head onto the work by hand. When using a die head on a heavy-duty turret lathe a mechanism of some type is recommended which will enable the operator of the machine to relieve the head of the load of the heavy turret and carriage. By doing so, more accurate lead will be obtained. The usual type of sliding adapter provides a floating action which permits the operator to advance the turret independent of the head, but no provision is made for starting the die head onto the work other than by means of the rack and gear which are ordinarily used to advance the carriage.

With the new Landis adapter the forward or thread starting movement of the die head is accomplished through an intermediate gear mechanism contained within the adapter. A rack gear is milled axially along the peripheral surface of a bushing to which the die head shank is fitted. A pinion gear, whose teeth engage the rack gear on the bushing, is fitted with a long handle which is used to actuate the movement of the bushing. The length of travel of the bushing is controlled and the die head is automatically opened by a lug which extends through a longitudinal slot in the adapter housing. A threaded stud, anchored in the base of the housing, passes through a hole in the lug and is fitted with lock nuts which can be adjusted to limit the travel of the bushing.

The use of an adapter of this type assures a perfect starting action for the head regardless of the weight of the turret and carriage. The lead of the thread is controlled more accurately and the quality of the thread is improved.

"Super-Traction" Tire

THE B. F. GOODRICH COMPANY

Six new lines of "Super-Traction" tires for off-the-highway service, especially in mud and snow are announced by The B. F. Goodrich Company, Akron, Ohio.

Leading these new products are the new "Truck-Bus Super Traction" tires in a complete range of sizes, both balloon and high pressure. These tires have broader, flatter treads with deep, self-cleaning design for surefooted traction in mud and gumbo.

"Leak-Loss" Chart

The distinctive feature of a new catalog brought out this month by M. B. Skinner Company, South Bend, Indiana, is a "leak-loss" chart which shows how much steam, water, oil or air escapes from various size leaks in pipe, under various pressures. Figures show what these leaks cost at various unit prices. Nine different styles of pipe repair clamps, for stopping leaks without replacing pipes, are shown.

Slush Pump Bulletin

Oil Well Supply Company, Dallas, Texas, recently issued a bulletin describing its "Oilwell" No. 14-P (7¼x14) power slush pump. The new bulletin, No. 62-A (139), is ready for general distribution.

WANTED: Salesman, experienced in selling pumping units and surface equipment, to fill the position of Sales Manager. Address Muskogee Iron Works, Muskogee, Oklahoma.

WANTED—To buy casinghead gasoline plant now operating and producing from ten to twenty thousand gallons per day. Prefer Arkansas, Louisiana or South Texas. Give specifications of equipment, location and price. Address I. Rudman, Box 2018, Tyler, Texas.

NOTES FOR THE Equipment Buyer and User

W. A. Huber Named Sales Manager for Gilmore Wire Rope

Appointment of W. A. Huber as manager of sales of the Gilmore Wire Rope Division of Jones & Laughlin Steel Corporation was announced last week.

Huber has been with Jones & Laughlin Steel Corporation since 1936 and prior to that time had been in public accounting and sales work for a number of years.

W. A. HUBER
Sales Manager, Gilmore Wire Rope Division

Harry H. Weining Heads Copes Research

Northern Equipment Company, Erie, Pennsylvania, has announced appointment of Harry H. Weining as in charge of all research projects concerned with the Copes system of boiler-feed control and allied equipment.

Weining joined the Copes organization in June, 1926, immediately following his graduation from Pennsylvania State College as a Bachelor of Science in Mechanical Engineering. After completing the cadet engineer training course, he served for a number of years as an inspection engineer. More recently, he has been dividing his time between development work and service engineering on new products. He is a member of Tau Beta Pi, honorary engineering fraternity.

Assisting Weining will be Francis W. Bunting and William E. Veenschoten.

Mission Representatives Assigned Oklahoma and Kansas Territory

Allan Nelson, formerly with headquarters at Tyler, Texas, from which center he served as Mission Manufacturing Company's representative for East Texas, has recently been transferred to Oklahoma City, phone number, 8-7612. From this address he will serve Kansas and that part of Oklahoma north of Ada.

Fred S. Price, representative for Mission Manufacturing Company, with headquarters in Wichita Falls, Texas, phone number 8006, will serve in addition to his present territory, that part of Oklahoma south of Ada.

Robert W. Lea Elected Johns-Manville Vice President

Announcement is made by Lewis H. Brown, president of Johns-Manville Corporation, that Robert W. Lea, who has been president of the West Virginia Coal & Coke Company, has been elected a vice president of Johns-Manville Corporation.

Lea will be in charge of finance, and

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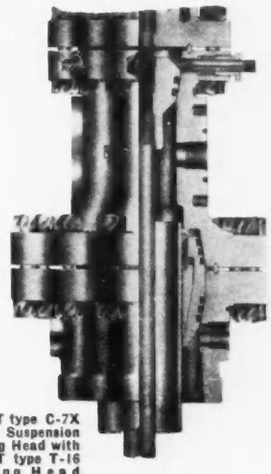
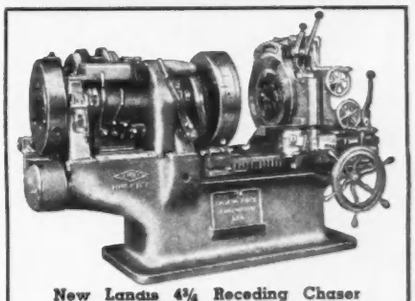
SOUTHWEST'S LARGEST EXPOSITION
Wichita, Kansas
Feb. 21-22-23-24, 1939
12th Annual
Southwest Road Show and School
Largest Display of Road Construction and Industrial Machinery in the Southwest
36th Annual
Western Tractor and Power Farm Equipment Show
World's Largest Exhibit of Modern Farm Machinery
Admission free to all exhibits
Southwest's Largest Assembly of Men, Machinery and Materials in 1939

O-C-T SLIP SUSPENSION CASING HEAD permits drilling, running and cementing casing and hanging casing at any desired point through oversize flanged blowout preventer equipment. Last joint of casing is cut off above hanger and welded thereto as shown below . . . no special length joint of casing is required. T-16 Tubing Head flanged above Casing Head, as shown below, permits drilling in and running and landing tubing through blowout preventer equipment. Lock down screws force hanger into sealing position before removal of preventers.
Full particulars gladly sent on request.



O-C-T type C-7X Slip Suspension Casing Head with O-C-T type T-16 Tubing Head flanged above.
OIL CENTER TOOL CO.
O-C-T
HOUSTON, TEXAS, U.S.A.
CABLE ADDRESS "OCENTOL"
Sold Through Supply Stores

Standco NO-SMOKE
STANDCO BRAKE LINING
Nothing novel—no bunk—but it gets the job done without scoring brake rims. See page 2100, Composite Catalog.
Standard Brake Lining Co.



New Landis 4¾ Receding Chaser Pipe Threading Machine
COMPLETE LINES
Machine Tools—Metal Working Machinery—Bolt and Pipe Threading Machines—Electric Arc Spot and Butt Welders—Hand Power and Electric Traveling Cranes—Foundry and Forge Shop Equipment
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7-2874

will take over the position formerly held by Enders M. Voorhees who left Johns-Manville to become chairman of the finance committee of United States Steel Corporation.

Lea resigned as president of the West Virginia Coal and Coke Company January 18, but he will remain on the board of directors of that company. He will assume his new duties with Johns-Manville Corporation about the end of March.

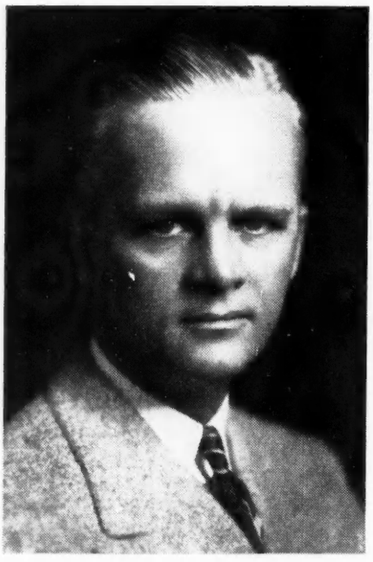
Born in Woodville, Wisconsin, Lea graduated from the University of Wisconsin, School of Commerce, with an A. B. degree in 1907. He worked first for Otis Elevator Company; and then, from 1911 to 1917, was with Moline Plow Company, serving as vice president in charge of Western sales branches and of the company's export sales.

During the World War he served as major and later as colonel in the Procurement Division of the United States Army, where he had charge of the purchase and distribution of all animal-drawn transportation and equipment for the U. S. military forces.

After the war, he served from 1919 to 1926 as vice president and general manager of Stephens Motor Car Company. He was president of Moline Implement Company from 1926 until 1929, when he joined Continental National Bank, Chicago. During 1933 he was administrative assistant of the NRA in Washington. Then followed two years as president of Hammond Lumber Company, San Francisco.

Unibolt Official on South American Tour

Chas. W. Thornhill, vice president, Thornhill-Craver Company, Houston, flew out of Miami, Florida, early in February, the first leg of an extended air tour of South American fields covering several months. First stop was Barranquilla, Colombia, which country he will travel by air, water and rail to reach all points of important activity, thence to Ecuador, Peru and Chile. His schedule calls for return from the northern interior of the continent to Maricaibo, and through Eastern Venezuela to Port of Spain, Trinidad, within two months. Here he will be met by Mrs. Thornhill, who will accompany him to Rio De Janeiro and Buenos Aires, from which point Thornhill will fly to Patagonia, in the extreme lower section of the Argentine Republic. The Unibolt line now has company representation in leading South American points, established by Kenneth Craver on previous trips.



Chas. W. Thornhill

Schlumberger Official Returns to Europe

P. Charrin, vice president of Schlumberger Well Surveying Corporation of the United States and manager of European activities of Societe de Prospection Electrique, was scheduled to return to Paris, France, in February after an extended trip through countries on this side of the Atlantic. Charrin left Paris in November and spent December in Venezuela and Trinidad. He arrived in Houston January 10 and left there for France January 28.

J. H. Williams & Co. Moves New York Office

J. H. Williams & Co., manufacturers of Superior Drop-Forgings and Drop-Forged Tools, has moved its New York office from 75 Spring Street a block distant to 225 Lafayette Street, corner of Spring Street. The Spring Street station of the I.R.T. east side subway is located practically at the office door.

William P. Bradbury Dies

William P. Bradbury, 53, vice president and general sales manager of Consolidated Ashcroft Hancock Division of Manning, Maxwell & Moore, Inc., Bridgeport, Connecticut, died January 14. He joined Manning, Maxwell & Moore in 1902 as an office boy. Advancing step by step through various positions in the sales department, assignments took him to every part of the United States and some foreign countries. In 1923 he was made general sales manager and in 1930 vice president in charge of sales, the position he held until his death.

New Tubing Head Described

Oil Well Supply Company, Dallas, Texas, has ready for distribution Bulletin No. 196 (139), describing the new casing head designated as Type 38. In addition to describing the casing head, the bulletin illustrates how it is used with the "Oilwell" Type 36 tubing hanger.

Instruments

The Brown Instrument Company, Wayne and Roberts Avenue, Philadelphia, has published a new folder illustrating the complete line of indicating, recording and controlling instruments for measuring and controlling temperatures, pressures, flows, liquid levels and humidity.

PROVES BEST

—or Costs You NOTHING!

"The Entirely Different Boiler and Engine Treatment"

Try Sand-Banum for 30, 60 or 90 days. If at the end of that period you are not entirely satisfied with results, or you find it does not do everything we say it will, you pay us nothing and you owe us nothing!

Hundreds of modern power plant operators, who are really interested in the most efficient way to control scale and corrosion in boilers and engines, have tried Sand-Banum on this fair offer. This pure colloidal concentrate **speaks for itself;** you prove its value in **your own equipment** before you buy it!

Compare its simplicity with all other methods: Comes ready to use in 16-oz. cans; yet one can will protect a 250 Hp. boiler for a month! Ounces are used instead of hundreds of pounds of "chemicals"; yet it is absolutely safe to equipment or persons. Regardless of the operating conditions or the nature of the water used, scale or corrosion cannot form or remain in its presence!

Write us today for a test and prove "The Best"!

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Stocks carried by WESTERN SAND-BANUM COMPANY
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and at other convenient points including leading supply houses

Squeaks from the Bull Wheel

Splitting Fees

I guess you're getting a good thing o' tending the rich Smith boy, ain't ye, doctor?

Well, yes; I get a pretty good fee. Why?

Well, I hope you won't forget that my Willie threw the brick that hit 'im.

Air-Minded

Gosh; you must have plenty of nerve to come down in a parachute in a hundred mile gale like this.

I didn't come down in a parachute, I went up in a tent.

Absentee Handyman

Say, have you folks a bottle opener around here?

Yeah, but he's away at college.

Defined

Robert, can you tell me what is meant by a polygon?

I guess it means a parrot that's dead, doesn't it?

Preparedness

He—I've wanted to ask you a question for weeks.

She—And I've had the answer ready for months.

He Looked

"Did Jerry look around a bit before he married the farmer's daughter?"

"I'll say he did, but every time he did, he looked into the muzzle of that shotgun!"

What!

"But, dear, I am late for dinner because I have had my nose to the grindstone all day."

"Well, you had better get a grindstone that doesn't leave face powder, rouge, and lipstick all over you.

Stops

And is your boy friend a hit-and-run driver?

I should say not! When he makes a hit, he parks.

Reasonably Safe

You haven't said a word for twenty minutes.

Well, I don't have anything to say.

Don't you ever say anything when you have nothing to say?

No.

Well, then, will you be my wife?

Misunderstood

"Please give me a pound of floor wax."

"I'm sorry, Miss, but we sell only sealing wax."

"Don't be silly. Why would anyone want to wax the ceiling?"

Reflection

"Yes it was love at first sight."

"Well, why didn't you marry him then?"

"Oh, I saw him several times after that."

Generalization

An employee asked his boss for a raise in salary, and to back up his request he informed his chief that several other companies were after him. It was some months later that the boss discovered the employee was referring to the gas company, the water company and a time payment furniture concern.

Auto Suggestion

"Do you have much variety at your boarding house?"

"Well, we have three different names for the meals."

Fast Thinking

"Sandy, here comes company for supper."

"Quick, everybody run out on the porch with a toothpick!"

Chicken Salad

"Give me a chicken salad."

"Do you want the 40c one or the one for 50c?"

"What's the difference?"

"Well, the 40c one is made out of veal and pork, and the 50c one is made of tuna fish."

Swi(l)nging It

"Did Clarice enjoy her date with Joe last night?"

"She was never so humiliated in her life. When he started to eat his soup, five couples got up and began dancing."

Affectionate

"This steak is not very tender.

"Well, did you expect it to put its arms around you and kiss you?"

Lovers Both

My husband was a grand lover.

Mine still is a grate lover—sits by the stove all day long.

Sympathetic

Lady, I lost my leg and thought perhaps you—.

Well, I haven't got it here.

Not Required

"A statesman is supposed to be familiar with all public questions."

"Yes, but not necessarily with all the answers."

Cop's Mistake

As soon as I saw you come around the curve, I said to myself, "Forty-five at least."

Well, you're away off. It's this hat that makes me look so old.

Made Wise

Funny no one seemed to realize what a bad egg he was while he was rich.

A bad egg is only known when it's broke.

Makes a Difference

Is it true that it's bad luck to have a black cat following you?

Depends on whether you're a man or a mouse.

SAVE YOUR WELLS

With A —

MILLER

The hero saves the homestead and gets the villain. MILLER Sand Pumps get the sand and sediment—*save your wells and increase production.*

The MILLER is made in diameters of 2½, 3, 3½, 4, 4¼, 5, 5½, 7 and 9 inches and lengths of 20, 25 and 30 feet. 5/32-inch wall thickness in REGULAR Type. ¼-inch wall tubes HEAVY Type Sand Pumps.

INTERCHANGEABLE BOTTOMS

To Meet Every Condition

● **BAILER BOTTOM**

With the Bailer Bottom installed the MILLER is quickly changed to a Bailer giving you a combination of either Bailer or a Sand Pump in one tool.

● **SAND BOTTOM**

Used when tools are run and when well is shot to quickly remove loose material.

● **STAR BOTTOM**

Used for cutting the sand loose.

● **CHISEL BOTTOM**

(In Pump)

With this bottom tightly packed sand can be easily broken in small pieces so it can be picked up in the pump.

Write for Descriptive Folder and Price List

See Pages 1564-65 COMPOSITE CATALOG

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NO. 1523608
NO. 1787390
NO. 1862628
NO. 1866028
NO. 2055667

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